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# Parents' Knowledge, Attitudes and Behavior About Child Passenger Safety

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16. Abstract Because automobile accidents are a major killer andcripler of young children in this country, Tennessee passed a child passenger protection law requiring restraint of children under four years of age in family automobiles. Passage of this law facilitated examination of parents' beliefs about child passenger safety in relation to public policy as well as public information and educational programming. The specific research questions in this study were as follows: (1) Do parents who use child restraint systems with their children under four years of age differ from those parents who do not use them in knowledge, attitudes, and behavior regarding restraint systems and automobile occupant protection legislation? (2) Do parents interviewed after the law took effect differ from parents before the law took effect in knowledge, attitudes, and behavior regarding restraint systems and automobile occupant protection legislation? From a sample of over 5,000 parents in Tennessee, data collected from almost 1,000 parents in a three-tiered procedure were analyzed. Differences between users and nonusers in knowledge and attitudes were identified, as were differences in knowledge, attitudes, and behaviors of parents at three points in time. Defferences in level of use were explained in relation to predisposing factors (e.g., beliefs, including knowledge, attitudes, values, and previous behavior), reinforcing factors (e.g., physical factors such as comfort, convenience, protection, and economic benefits; psychological factors such as approval, assistance and modeling), and enabling factors (e.g., external factors such as accessibility and availability; internal factors such as skills and information processing style).					
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## METRIC CONVERSION FACTORS

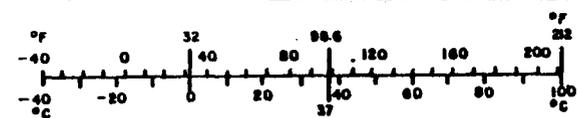
### Approximate Conversions to Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
<b>LENGTH</b>				
in	inches	2.5	centimeters	cm
ft	feet	30	centimeters	cm
yd	yards	0.9	meters	m
mi	miles	1.6	kilometers	km
<b>AREA</b>				
in <sup>2</sup>	square inches	6.5	square centimeters	cm <sup>2</sup>
ft <sup>2</sup>	square feet	0.09	square meters	m <sup>2</sup>
yd <sup>2</sup>	square yards	0.8	square meters	m <sup>2</sup>
mi <sup>2</sup>	square miles	2.6	square kilometers	km <sup>2</sup>
	acres	0.4	hectares	ha
<b>MASS (weight)</b>				
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons (2000 lb)	0.9	tonnes	t
<b>VOLUME</b>				
tsp	teaspoons	5	milliliters	ml
Tbsp	tablespoons	15	milliliters	ml
fl oz	fluid ounces	30	milliliters	ml
c	cups	0.24	liters	l
pt	pints	0.47	liters	l
qt	quarts	0.96	liters	l
gal	gallons	3.8	liters	l
ft <sup>3</sup>	cubic feet	0.03	cubic meters	m <sup>3</sup>
yd <sup>3</sup>	cubic yards	0.76	cubic meters	m <sup>3</sup>
<b>TEMPERATURE (exact)</b>				
°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

\* 1 lb = 2.54 (exactly). For other exact conversions and more detailed tables, see NBS Misc. Publ. 286, Units of Weights and Measures, Price \$2.25, SD Catalog No. C13.10-286.

### Approximate Conversions from Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
<b>LENGTH</b>				
mm	millimeters	0.04	inches	in
cm	centimeters	0.4	inches	in
m	meters	3.3	feet	ft
km	kilometers	1.1	yards	yd
		0.6	miles	mi
<b>AREA</b>				
cm <sup>2</sup>	square centimeters	0.16	square inches	in <sup>2</sup>
m <sup>2</sup>	square meters	1.2	square yards	yd <sup>2</sup>
km <sup>2</sup>	square kilometers	0.4	square miles	mi <sup>2</sup>
ha	hectares (10,000 m <sup>2</sup> )	2.5	acres	
<b>MASS (weight)</b>				
g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
t	tonnes (1000 kg)	1.1	short tons	
<b>VOLUME</b>				
ml	milliliters	0.03	fluid ounces	fl oz
l	liters	2.1	pints	pt
l	liters	1.06	quarts	qt
l	liters	0.26	gallons	gal
m <sup>3</sup>	cubic meters	36	cubic feet	ft <sup>3</sup>
m <sup>3</sup>	cubic meters	1.3	cubic yards	yd <sup>3</sup>
<b>TEMPERATURE (exact)</b>				
°C	Celsius temperature	9/5 (then add 32)	Fahrenheit temperature	°F



## ACKNOWLEDGMENT

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## PREFACE

This report is one in a series of 11 reports on the Child Passenger Safety Program in Tennessee. These reports are:

1. The Tennessee Child Passenger Safety Program;
2. The Impact of a Child Passenger Restraint Law and a Public Information and Education Program on Child Passenger Safety in Tennessee;
3. Development of Materials and Public Relations Efforts to Promote Child Passenger Safety;
4. Use of Telephone Surveys to Determine Awareness of Tennessee's Child Passenger Protection Law;
5. Organizational Networks for Promoting Child Passenger Safety;
6. Judicial Perspectives on Child Passenger Protection Legislation;
7. Enforcement of the Child Passenger Protection Law;
8. Development of Child Passenger Safety Component for Driver Education Programs;
9. Parents' Knowledge, Attitudes and Behavior About Child Passenger Safety;
10. Child Restraint Device Loaner Programs; and
11. Compliance with the Child Passenger Protection Law: Effects of a Loaner Program for Low-Income Mothers.

In this report, the beliefs of parents about child passenger safety are described. Cognitive, affective, and behavioral components of beliefs are included, with particular attention to the relationship of these components to the Tennessee Child Passenger Protection Act. Differences in child restraint device usage patterns, attitudes about child passenger safety, and knowledge of the law were identified in relation to time, with improvements in all dimensions after passage of the law. Differences in knowledge and attitudes of parents who were identified as users and nonusers of child restraint devices also were identified, with users higher than nonusers on both dimensions. Differences in level of use were explained in relation to predisposing factors (e.g., beliefs, including knowledge, attitudes, values, and previous behavior), reinforcing factors (e.g., physical factors such as comfort, convenience, protection, and economic benefits; psychosocial factors such as approval, assistance, and modeling), and enabling factors (e.g., external factors such as accessibility and availability; internal factors such as skills and information processing style).

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## I. INTRODUCTION

The battered child syndrome--an injury pattern resulting from parental abuse--has been widely described in the medical literature and the popular press. Yet automobile collisions are the most common cause of injury in childhood and they receive little attention. This injury complex should be described as the neglected child syndrome since ample evidence indicates that a great many of these injuries could readily be reduced or prevented by simple parental action. (Siegel, Nahum, and Appleby, 1968, p. 77)

Although parental action is essential to a child's safety as an automobile passenger, relatively few parents protect their children by using child restraint systems. In fact, the leading cause of death to children over one month of age and less than four years of age is the automobile accident (National Safety Council, 1977). However, parents generally take less action against automobile passenger dangers than they do against childhood diseases and household accidents.

### Background

Parents who probably would be shocked at the notion that they are abusing or neglecting their children continue to expose these children to unnecessary harm. Williams (1976) found that only 7 percent of the automobile passengers he observed who were less than 10 years of age were restrained. Preliminary analysis of child restraint system usage rates from observational data collected in Tennessee in 1977 revealed that only about 10 percent of the children under four years of age who were observed in urban settings were restrained (Heathington, Moss, Geiss, Perry, Hughes, Philpot, and Wyrick, 1978).

Automobile accidents are a primary cause of death in other age groups as well; however, children less than four years of age are at a consistently greater risk because of their special physical characteristics. In normal development, the head and shoulder area of the young child is heavier and more fully developed than the abdominal area. The effect of these characteristics on both totally unrestrained young children and young children who are restrained in adult systems can be demonstrated. Generally young children are more likely to sustain head injuries in automobile accidents than are older passengers. Actually the adult system may injure the young child by concentrating the resistance entirely on the soft abdominal area or by allowing the child to fly out of the system on impact. The shoulder strap component of the adult system should not be used with a child under 55 inches (1.4 m) because it usually will fall across the neck region rather than the chest area.

The detrimental effects of riding unrestrained or restrained in an adult-size system can be reduced significantly by the proper use of a crashworthy child restraint system (Scherz, 1974). A significant reduction of harm resulting from sudden stops, distraction of the driver, and falling out of moving vehicles also reasonably could be expected from such restraint system use.

Therefore, it is desirable that young children be protected through the proper use of crashworthy child restraint systems. Although children themselves may contribute significantly to their parents' willingness or unwillingness to adopt consistent use of a child restraint system by how the children react to its use, ultimately parents are responsible for the crucial decision to take or fail to take protective action.

The State of Tennessee recognized parental responsibility for child passenger protection by adopting legislation requiring parents to provide for the passenger safety of their children less than four years of age (see Appendix A). Although the Tennessee law included several weaknesses, it has been acclaimed by highway safety experts across the country as a major accomplishment.

The primary goal of the law, of course, is to reduce the number of deaths and injuries sustained by young child passengers. However, the mere passage of the law does not ensure the desired results. The National Highway Traffic Safety Administration and the Tennessee Governor's Highway Safety Program sponsored a public information and evaluation program to bolster the impact of the law.

The objectives of the Child Passenger Safety Program included determining the rate(s) of compliance with the law as well as evaluating the impact of various public information and education program combinations in different cities across the state. Data were collected to assess compliance with the law in relation to the various types of public information and education programs. Information related to awareness and knowledge of the law, attitudes toward passenger safety, and ownership of child restraint devices also were obtained.

### Rationale

Parents ultimately are the ones who are responsible for the provision and use of child restraint systems. In addition to examining possible overt behavioral changes in response to external environmental conditions such as a law, it is necessary to develop an improved understanding of the interrelationships of factors which mediate behavioral changes.

An improved understanding of these factors and their potential roles in the mediation of behavioral changes in regard to child passenger safety will contribute to the development of more effective and efficient strategies for public information and education programs, public policies, and child restraint system design. Also, in order to contribute to an improved understanding of the broader issues of automobile occupant protection in general and the possible relationships of those issues to child passenger protection issues, it is necessary to consider parental beliefs with regard to adult occupant protection and government regulation of occupant protection as well as specific beliefs regarding child passenger protection.

### Conceptual Framework

A framework for examining parents' beliefs about child passenger safety was drawn from the integrative work of Rokeach (1972). A model of Rokeach's theory is shown in Figure 1-1. As shown in the model, Rokeach (1972) explained the relationship between beliefs and behavior by saying that

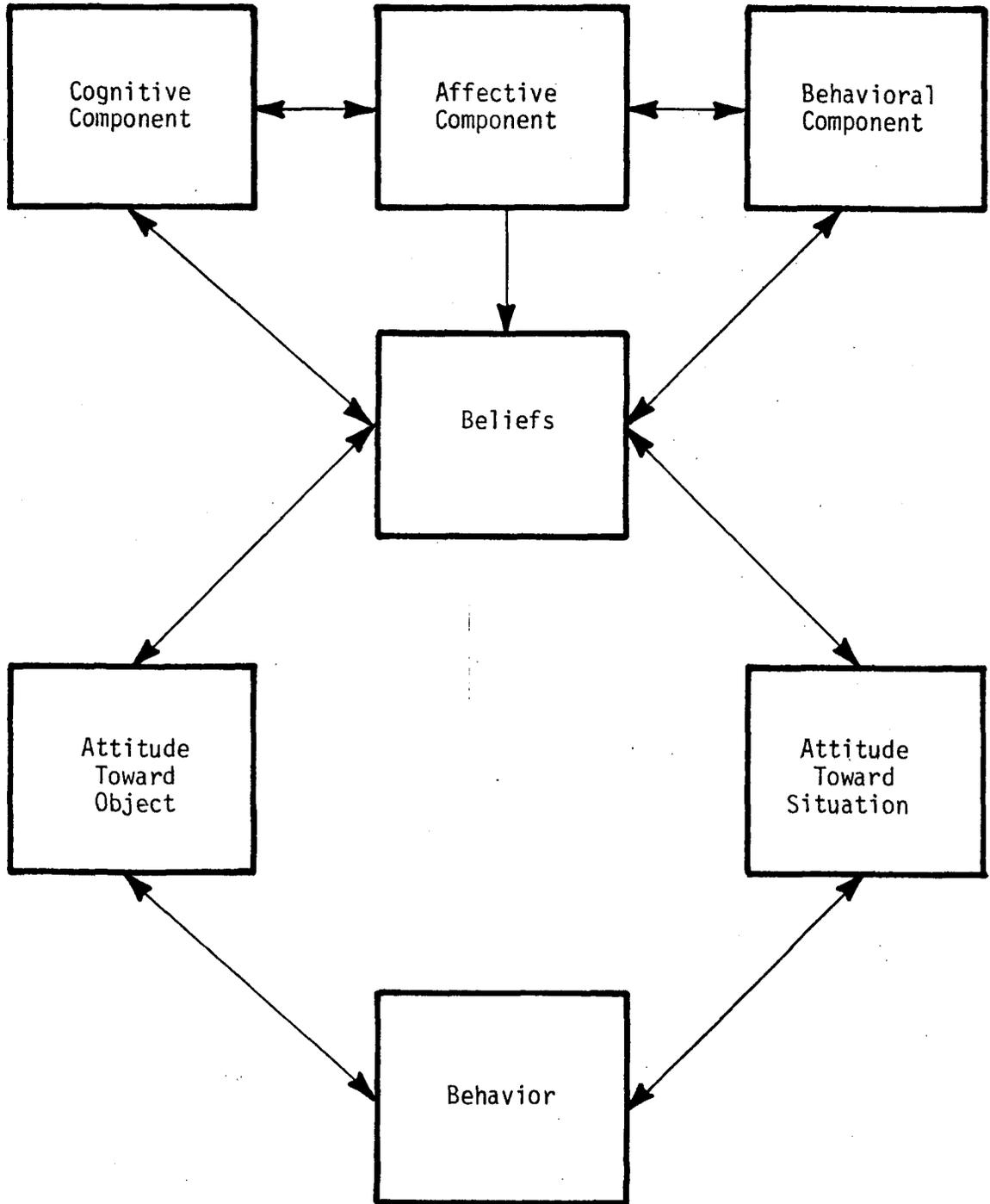


FIGURE I-1

A MODEL OF THE RELATIONSHIPS AMONG ATTITUDES,  
KNOWLEDGE, AND BEHAVIOR

"behavior is a function of the interaction between two attitudes--attitude-toward-object and attitude-toward-situation" (p. 127). Furthermore, he asserted that the beliefs which compose these attitudes have three components-- a cognitive component, an affective component, and a behavioral component.

A consideration of this model related to child passenger protection highlights some of the areas which might benefit from further investigation. For example, the cognitive component of Rokeach's model would include knowledge and awareness of the law. The affective component would include attitudes about government as well as about restraint systems and their use. Actual experience related to use of child restraint systems, of course, would be an example of the behavioral component. The interrelationships of these components would make up the belief system on which specific attitudes toward restraint systems and using them on a particular occasion would be based.

### Conceptual Definitions

Beliefs are descriptive, evaluative, or exhortative statements which are predispositions to actions (Rokeach, 1972, p. 113). They contain a cognitive component, an affective component, and a behavioral component which, because the content varies, are combined in different ways in relation to specific conditions.

Awareness and knowledge of the law would be an example of the cognitive component of the belief system. For the purposes of the present study, awareness of the Tennessee child passenger protection law was defined as being informed of the existence of the law. Knowledge of the law was defined as accurately identifying parts of the statute.

The affective component of the belief system is focused on attitudes. In the present study, attitude toward government regulation of automobile passenger protection and attitude toward use of adult restraint systems were defined as the organization of beliefs about those subjects which involved a predisposition to respond in some preferential manner (Rokeach, 1972, p. 112). Perceived cost was defined as the comprehension of the expenditures (including time, energy, money, and other resources) required to procure something or take certain actions.

Behavior was defined as the application of the belief system to a particular object in a particular situation on a specific occasion. Use behavior in the present study was defined as the action to engage the belief system in such a way that a parent places a child in a child restraint system.

Concepts used in the present study encompassed government regulations in general and, more specifically, the Tennessee child passenger protection act. Government regulations were defined as statutes, ordinances, and rules which specify standards of conduct. The Tennessee child passenger protection act is the popular name for the statute expressed in the Tennessee Code 59 § 930, 1977.

There are two basic types of manual occupant restraint systems. An adult restraint system is composed of safety belts designed to hold a passenger more than four years of age in position inside the vehicle; it includes a lap belt component and usually an additional shoulder belt component. A

child restraint system is a crashworthy device used in conjunction with an adult restraint system to protect a young child from injury by holding the child in position inside the vehicle. The term child restraint system has been employed synonymously in popular usage with the term child restraint device, and the latter terminology has been employed in various instruments and other publications of the Child Passenger Safety Program. Technically, however, the term device refers only to the child restraint apparatus.

### Assumptions

The consideration of the interrelationships among beliefs and behaviors with respect to child passenger protection was based on certain assumptions. These included the following:

1. It is appropriate for government to regulate behavior in the area of passenger protection.
2. It is a parental responsibility to provide for the proper protection of child passengers.
3. The proper use of child restraint systems has been demonstrated as highly effective in preventing deaths and injuries.
4. The proper use of adult restraint systems can prevent deaths and injuries of older children and adults.
5. Beliefs include cognitive, affective, and behavioral components.

### Purpose

The major objective of the present study was to determine if use of child restraint systems and the presence of the law were related to differences in parents' beliefs. More specifically, this study was an attempt to answer the following questions: Do parents who use child restraint systems with their children less than four years of age differ from those parents who do not use them in knowledge, attitudes, and behavior regarding restraint systems and automobile occupant protection legislation? Do parents interviewed before the law took effect on January 1, 1978, differ from parents interviewed six months and one year after the law took effect in knowledge, attitudes, and behavior regarding restraint systems and automobile occupant protection legislation?

## II. REVIEW OF LITERATURE

Understanding the relationships among beliefs and behavior with respect to child passenger protection requires an understanding of the nature of beliefs as well as the various elements of the occupant protection issue. Although the particular emphasis in this study was on child passenger protection, information on the larger issue of occupant protection provides not only an analogous situation but also a context in which to view the relatively new issue of child passenger protection. The use of motorcycle helmets in America is another transportation safety issue that is parallel in political considerations and comfort/convenience dimensions to the issue of child passenger protection. Other preventive health behaviors also have similarities to child passenger protection in the application to families and children; examination of these issues is relevant to establishing areas of analogous beliefs and behavior which have potential implications for an improved understanding of child passenger protection behavior.

### Beliefs

Beliefs are the way people organize their responses to the world in which they live. Many researchers have used the terms belief and attitude in either overlapping or interchangeable ways. Much attention has been focused on how beliefs and attitudes are formulated and changed. Over a dozen different theoretical perspectives have been identified and discussed (Insko, 1967). These perspectives can be categorized for greater ease in consideration as cognitive consistency, learning, and functional.

Rokeach's (1972) perspective on the relationships among beliefs, attitudes, and behavior falls into the cognitive consistency category. Rokeach studied the types and relative centrality of beliefs and found five basic categories of beliefs with varying levels of relative centrality. Rokeach (1972) suggested that the more central a belief is, the more it will resist change, and greater changes in the belief system are more likely to occur when more central beliefs are changed. These suggestions were supported by his research involving the experimental manipulation of belief changes through hypnosis.

Rokeach investigated the concept of belief congruence in studies involving differences in beliefs and differences in race. He reported that there was a preference for belief congruence which takes precedence over similarity of race in situations where external pressures to conform were low. This is particularly noteworthy because the studies on which this report was based were conducted in the early 1960s when race was an extremely controversial social issue. The potential importance of both external pressures and belief congruence was highlighted in these findings.

In addition to the congruence theories, other perspectives which can be placed under the general heading of consistency approaches include the balance and dissonance approaches (Suedfeld, 1971). Balance theories are based on the feelings (affect) toward other people in the system, and dissonance theories are based on the incompatibility of cognitions held by the individual.

All these consistency approaches are based on the "assumption that an individual attempts to avoid psychologically inconsistent cognitions" (Beisecker & Parson, 1972, p. 10). These theories are focused on how shifts in cognitions, feelings, and behaviors are made in relation to these inconsistencies (Rosenberg, Hovland, McGuire, Abelson, & Brehm, 1960). Sources of inconsistencies include new information, other people, experiences with objects, and experience in different environmental settings.

Rokeach (1960) has suggested that people's minds tend to be relatively open or closed systems. His research on the formation of new belief systems and the role of prior experience in problem solving in relation to the relatively open or closed system is relevant to acceptance of new practices and products (e.g., child restraint systems). Rokeach suggested that people who tend to represent more closed systems also tend to have more difficulty in the formation of new belief systems. He found that people characterized as relatively more closed systems tended to have more difficulty in remembering new beliefs and in synthesizing them. These people also tended to be more unwilling to consider new belief systems.

Rokeach (1960) also found that the role of prior experience was related to differences in synthesizing ability. People who had past experience with a situation were more likely to experience greater ease and speed in synthesizing the new beliefs. Differences in synthesizing skill and speed also appeared to be related to people's basic orientation toward new systems in general.

Harvey, Hunt, and Schroder (1961) also have suggested the existence of relatively more closed and relatively more open systems. In speaking of conceptually open and closed systems in relation to relatively more concrete and relatively more abstract functioning, they suggested that both concrete and abstract processors maintain some degree of closedness. However, more abstract processors only tend to maintain a temporary degree of closedness in order to restructure their conceptual systems in response to new information, whereas more concrete processors tend to maintain closedness as a way of avoiding dealing with new information. The statement that "the relation between behavior and concept is very complex in that the same behavioral response may be associated with two or more quite different conceptual structures, and similarly that the same conceptual structure may be associated with quite different behavioral responses" (Harvey, Hunt, & Schroder, 1961, p. 5) is helpful in considering overt discrepancies between behavior and beliefs and in theorizing about possible discrepancies.

Schroder, Driver, and Streufert (1967) have focused on the structure of human information processing. They have emphasized "how a person thinks or uses an attitude as a structure for processing new information, as opposed to an emphasis upon content, upon what a person thinks, what his [or her] attitudes are" (p. 127). Their emphasis on the structural variables rather than the content variables has implications for consideration in relation to situational variables and the relative contribution of these variables to behavior. For example, they have hypothesized that in a situation requiring integration of new information, the more concrete processor, because of greater integrative simplicity, will select the minimally incongruent item of information on which to base attitude, whereas the more abstract processor, because of greater integrative complexity, will select a larger quantity and diversity of information items on which to base attitude.

The learning perspectives on beliefs, attitudes, and behavior tend to be focused on their formation. Change is defined as a relearning process which does not differ from human learning of other types. In his perspective on attitudes, Doob (1948) emphasized a behavioral learning approach in which the individual is predisposed to act in certain ways because of earlier conditioning to similar stimuli. Perception of the stimuli, which could be information, other people, and experiences, is central to the learning theories. This is roughly parallel to the potential sources of inconsistency discussed in the cognitive consistency approach.

Functional theories tend to be focused on the usefulness of a particular belief/action to the achievement of the individual's goals. Katz (1960) is one of the major proponents of this perspective. He has emphasized behavior and categorized it as one of four types--instrumental, ego-defensive, value-expressive, and knowledge-seeking.

There are some parallels among these categories of behavior and the perceptions of behavior on which other theories are focused. For example, the instrumental type, which is focused on the attainment of patterns of thinking and behaving which will be rewarded, is much like the focus of learning theories. The knowledge-seeking and value-expressive types are much like the focus of cognitive consistency approaches, which are based on the reconciliation of seemingly incompatible cognitions. The ego-defensive type seems to be focused primarily on perceptions of other people and self-esteem. This type would seem to be a component of both cognitive consistency and learning theories. Smith, Bruner, and White (1956) have expanded upon the role of social consequences in the formation and modification of belief and attitude systems. Also, Schroder, Driver, & Streufert (1967) have suggested that as environmental costs increase, an individual's level of integrative abstractness will peak and then decline. These theories give import to the role of individual differences in motivation and perception (Suedfeld, 1971).

In summary, there is a wide range of perspectives on the formation and changes of beliefs and attitudes. Various theories have been more or less popular at different times in the past few decades. Cognitive consistency, learning, and functional theories all contain, with varying degrees of emphasis, the elements of cognition, effect, and behavior. No conclusive results on the exact pattern of the interaction among these components have been reached. At best, these theories support the conclusion that the components are interrelated, that they probably are related in highly individualistic ways, and that changes in the environment stimulate some sort of interactions among them which should be measurable.

### Automobile Occupant Restraint Systems

Research on automobile occupant restraint systems has included consideration of restraint effectiveness, extent of usage, and factors associated with usage. Most of this research has been focused on adult restraint systems or occupant restraint systems in general, but some research has been focused on child restraint systems.

Occupant restraint effectiveness. The safety of all occupants in a vehicle is interrelated. Unrestrained occupants actually can wound or injure fatally other occupants in the vehicle by striking people as they are thrown forward or sideways during an accident. Similarly, a driver who remains alert and in control of the vehicle during the crash may be able to reduce the severity of the accident. Because of the interrelatedness of occupants' safety, it is important to consider the restraint practices of each occupant as components of a safety system.

Several effectiveness studies have been focused on the adult restraint component of the safety system. A National Highway Traffic Safety Administration report reviewed eight safety belt studies (U.S. Department of Transportation, 1976a). The National Highway Traffic Safety Administration summarized its review of these studies by estimating that lap belts are 40 percent effective and lap- and shoulder-belt systems are 60 percent effective in reducing the number of occupant fatalities. Clearly, safety belt use does save lives and prevent injuries. The National Highway Safety Needs Study (U.S. Department of Transportation, 1976b) contains the following statement:

In reviewing programs of crash prevention and injury reduction, one countermeasure stands out clearly superior to all other countermeasures, and is perhaps superior to a combination of several other leading candidates. This is the effectiveness of occupant restraint systems in preventing death once an automobile crash occurs. (p. A-251)

Over 19 countries have recognized the public health benefits of safety belt use by requiring some level of manual occupant restraint usage by their citizens (Ziegler, 1977). In Sweden, for example, the Nordic Road Safety Council document on seat belts is a testimony to their efficacy in saving lives and reducing the number and severity of injuries (Torgersen, Eefsen, Satuli, & Hasselev, 1976).

Attention has been focused on the special needs of young children as part of the automobile safety system by articles such as the one by Shelness and Charles (1975). The purpose of this article was to inform pediatricians of the child's special needs, thereby increasing pediatricians' awareness of their responsibility to advise parents about child passenger protection. Shelness and Charles referred to the high injury and death rate for small children involved in automobile accidents. They also discussed the failure of the federal government to upgrade safety standards for child restraint systems and the general lack of public awareness concerning the value of properly used systems.

Scherz (1974) estimated that restraint usage by children could have saved the lives of 91 percent of the children under five years of age in his study and reduced the number of injuries by 78 percent. Follow-up reports of his research continue to include projections of proper restraint use effectiveness at near 100 percent for young children (e.g., Scherz, 1976).

Snyder and O'Neill (1975) highlighted the potential dangers of the 1974- and early 1975-model automobile safety belt interlock systems for young children. They echoed the concerns of physicians and engineers who had documented the anatomical differences between child and adult occupants. Based upon these anatomical differences and the safety belt systems' characteristics, Snyder and O'Neill concluded that the upper diagonal belt (shoulder belt) contributes to the injury of the child under certain impact conditions.

There are also indications that the seating location of the child is a factor in safety. Williams and Zador (1976), in an Insurance Institute for Highway Safety study, recommended that children should be restrained in the back seat. They found that the highest injury rate occurred with children who were sitting unrestrained in the right front seat.

Occupant restraint usage. Do people use restraining systems? Researchers have been active in seeking answers to this and related questions. Westefeld and Phillips (1975) reported usage rates for safety belts ranging from a high of 75 percent for occupants in 1974- and early 1975-model automobiles equipped with starter interlocks to a low of 45 percent usage during the following year. They estimated that as of 1976 only about 16 percent of motor vehicle occupants used their belts (Westefeld & Phillips, 1976). Williams (1976) reported in an Insurance Institute for Highway Safety study that 11 percent of passengers 10 years of age or older were restrained, 22 percent of the drivers were restrained, and only 7 percent of the passengers less than 10 years of age were restrained. Williams also estimated that 73 percent of the observed child restraint systems were used improperly.

Arnberg and Ericsson (1976) reported that 80 percent of the Swedish parents responding to their questionnaire indicated that they currently used child car seats or had used them until the children were too big for the seats. This reported usage rate was higher than that reported in a similar study conducted in 1973, at which time the usage rate was 57 percent. Arnberg and Ericsson also reported that the dangerous hookover seats had disappeared almost completely from use. However, Sweden is one of more than 20 foreign countries which have compulsory manual occupant restraint usage requirements for adults, and public information programs had been operating there for a number of years prior to the implementation of the law in 1975 (Pulley & Scanlon, 1976). In addition, because the child restraint system usage was self-reported, actual usage rates probably were somewhat lower.

Waller and Barry (1969) found that 77 percent of the U.S. drivers who self-reported that they always wore safety belts on local trips actually were wearing them when observed. Only 46 percent who reported they always wore safety belts on long trips actually were wearing them when observed. The observed usage rate for in-town (local) trips was 24 percent; the out-of-town (long) trip rate was 27 percent.

Fhaner and Hane (1973a) also conducted research on the accuracy of self-reports. They studied the accuracy of verbal reports by 105 English motorists whose usage was observed and compared later to self-reported usage. There was a fairly strong correspondence between reported and observed use.

Evaluations of compulsory manual occupant restraint usage regulations have been reported from countries around the world. All investigators have reported an increase in usage rates after compulsory regulation went into effect (Livingston, Fee, Knaff, Ziegler, Nichols, Trilling, Voas, & Womack, 1978; Pulley & Scanlon, 1976; Ziegler, 1977). Increases have been greatest and most stable with strict and consistent enforcement of the laws. The Insurance Institute for Highway Safety (1976) reported that in Ontario, where a compulsory safety belt regulation was put into operation, the initial dramatic rise in safety belt usage was followed by a decline. This decline put the overall gain in usage rates at about 20 percent rather than 50 percent as initially experienced. The National Highway Traffic Safety Administration Task Force Report on Safety Belt Usage Laws also included documentation of the decline with the comment that the law was weakened to exclude shoulder belt use in pre-1974 cars immediately prior to the decline in usage rates (Livingston et al., 1978).

A peak/decline pattern also has been observed in Victoria, Australia. However, an overall reduction in passenger casualties by 14.5 percent has been estimated (Andressend, 1972). Another study in Australia included consideration of the impact of a regulation requiring that children less than eight years of age not travel in a front seat position unless properly restrained by a child restraint system (Henderson, Vaughan, & Freedman, 1974). Although the researchers did not determine the actual reduction in deaths and injuries because of compliance, they did report a significant seating relocation of the target population.

Hoglund and Parsons (1974-75) have suggested an alternative route for influencing occupant restraint usage through comparative negligence laws. They reviewed a system in which occupants would be responsible for additional injuries received because of failure to use a restraint system. They estimated that such a system also would encourage insurance incentives for restraint usage.

Factors associated with child restraint system use. Based on research involving Tennessee families, Philpot, Heathington, Perry, and Hughes (1979) reported that the age of the child was a major factor in determining child restraint system usage. Usage was related inversely to age. Infants were protected 24.6 percent of the time, children 1- to 2-year-olds 18.8 percent of the time, 2- to 3-year-olds 8.1 percent of the time, and 3- to 4-year-olds only 5.5 percent of the time. The gender of the child was not related to usage.

Socioeconomic characteristics of the family have been found to be related to child restraint system usage (Perry, Heathington, Philpot, Pentz and Lo, 1980; Philpot et al., 1979). Income level and education level both were related directly to child restraint system use. Philpot et al. also reported higher child restraint system usage rates for families who owned their own vehicles, families who owned two vehicles, and families with one mate at home full time. These three characteristics may have been related to education and income. Although families with more than two vehicles were less likely to use child restraint systems than were families with two vehicles (Perry, et al., 1980). This finding may be related more to convenience and ease of child restraint

system installation than to socioeconomic characteristics. Car size and manufacturer were not related to usage, although tenuous relationships with body style and year of car were noted. People in station wagons were more likely to be using child restraint system, as were people in newer model cars. Again, these findings may be related to the income levels of the families.

Female drivers were more likely to be using child restraint systems with their children than were male drivers, parents more than nonparents, and married parents more than single parents. Drivers who were observed using their own seat belts were more likely to be using child restraint systems with their children than were drivers not using their own seat belts. In addition, in a separate self-report measure of safety belt use by the driver and passengers, the same relationship existed (Philpot et al., 1979).

Neumann, Neumann, Cockrell, and Banani (1974) reported the results of interviews concerning child passenger protection with 198 parents using the pediatric ambulatory clinic at the University of California Hospital in Los Angeles. English- and Spanish-speaking parents accompanied by at least one child under 15 years of age were included in the sample. In addition to collecting demographic information and self-reports of restraint system usage, the interviewer obtained information regarding the parents' knowledge of age-appropriate restraint systems, reasons for not using restraint systems, and the degree of internality.

Neumann et al. reported that many parents carried infants in the birth-to six-month age group in their arms or used inappropriate infant carriers. Appropriate use and nonuse of restraint systems were higher for children over six months of age than for younger children. The high rate of inappropriate use and holding of infants may be related to the somewhat confusing assortment of products commonly used with infants and the deceptively small size of these infants which may lead parents and others to believe that they can protect the infants in their arms.

In the Neumann et al. study, the highest percentage of appropriate use of child restraint systems or safety belts was reported by parents who had completed at least 12 years of schooling. Occupation of the head of the household, a variable usually related to income and education, was not associated with reported use. Children of married parents used restraint systems more than did children of single parents. Inappropriate use was more prevalent with the Spanish-speaking minority parents than for the American-born white parents, although the category of no use was roughly equal for the two groups. The extent of no use was almost double for multiple-child families.

Neumann et al. also reported that neither knowledge of age-appropriate restraint systems nor knowledge of auto accidents as the leading cause of death to children was associated with appropriate use. Appropriate use was not related to having had a relative or friend experience an injury-producing accident. However, a strong relationship between the reported use of seat belts by parents and appropriate use of restraint systems for children was reported. Parents' degree of internal control (belief in the ability to exert control over what happened in life) was related directly to reported appropriate use of restraint systems with their children.

Neumann et al. also found that parents were most likely to report discomfort of the children or inconvenience to themselves as reasons for not using restraint systems. Discomfort and inconvenience accounted for 29 percent of the reasons for failure to use. Other frequently cited reasons included forgetfulness, use only on long trips, belief that it is safer to hold child, self-perception as a careful driver, expense of restraint systems, and fear of being trapped during an accident.

Another study, focused only on families with ninth-grade students, was reported by Williams (1972). Information was collected from 386 students in health classes and questionnaires sent to their mothers and their fathers. The questionnaires dealt primarily with dental health behavior and included questions on other preventive health behaviors in addition to seat belt usage. Results were parallel to those of Neumann et al. (1974).

Williams found that parents' education, occupation, and use of safety belts were predictive of their children's use of restraint systems; furthermore, parents' use of restraint systems was a better predictor than the socio-demographic characteristics. He also reported that if one parent used a restraint system, the other was likely to do so also, and children were likely to use their restraint systems if both parents did. The personality characteristic of internal locus of control was not related to use for the boys and fathers but was for the girls and mothers.

White and Winship (1976) reported research conducted with 202 parents in South Africa. Although their findings paralleled those in the United States regarding the low usage rate of restraint systems and the lack of association between having a friend or relative involved in an accident and restraint use (Neumann et al., 1974), their findings differed in other areas. No association was found between the use of safety restraints and social class, education, or income. However, there was a relationship between the parent's use of a restraint system and the child's use on the day of the interview.

Two Swedish studies dealing with use of restraint systems for children may provide some additional insights on interpreting the American research. As part of a series of studies on use of rearward-facing restraint systems, large numbers of Swedish parents were given actual experiences in the installation and use of rearward-facing systems (Arnberg, 1974; Arnberg & Ericsson, 1977). Both groups of parents, those who had not used restraint systems previously and those who had used only forward-facing systems, reported that they actually preferred the rearward-facing systems after using them and did not encounter any difficulties greater than those experienced with other systems or nonuse (Arnberg, 1974). Arnberg and Ericsson (1977) found that parents who had not expected to be able to install the systems properly did so quite easily. They did note, however, that careful attention should be given to the development of clear installation instructions.

Although research directly related to use of child restraint systems has been limited somewhat, several variables have been reported to be related to use. Socioeconomic characteristics, convenience and comfort, the personality characteristic described as locus of control, parents' own restraint use, and parents' practice of other preventive health behaviors have been related to reported use of child restraint systems.

Factors associated with safety belt use. Usage rates are somewhat higher for safety belt systems than for child restraint systems. However, safety belt systems are currently standard equipment on automobiles, and efforts to focus public attention on their benefits have been underway since the 1960s. Considering the easy availability of the systems and the large amounts of public information and education program dollars spent to promote use, many researchers have been puzzled by the low usage rates.

Yankelovich, Skelly, and White (1976) reported that drivers were aware of the injury-reducing advantages of safety belts. They tended to blame the unsafe driving behavior of others for accidents, even though they reported taking risks themselves. Knapper, Cropley, and Moore (1976) found that most people believed that safety belts were effective. However, most of them usually did not wear their safety belts. Knapper et al. concluded that the nonuse problem was a consequence of the failure to acquire the habit of buckling up and did not reflect distrust of safety belt systems or any deep-seated system of attitudes and beliefs.

Socioeconomic factors (particularly education) have been reported to be related to use of safety belt systems in several studies (Fhaner & Hane, 1973b; Helsong & Comstock, 1977; Heron, 1975; Morgan, 1967; Robertson, O'Neill, & Wixom, 1972; Sweetzer, 1967; Williams, 1972). These findings were parallel to those for child restraint system usage in relation to socioeconomic factors.

Sweetzer (1967) supported the findings that passengers' use influences each other and specifically that parents and children influence each other. She reported that people who indicated that they used safety belts when driving alone were more likely to try to get passengers to use them. Children were more likely than other passengers to be asked to buckle up and were more likely to ask the drivers to buckle their safety belts. People who reported low use were more likely to say that they used safety belts on vacation trips than on local short trips.

Morgan (1967) supported the child restraint system-oriented studies in which use was linked with engaging in other preventive health behaviors. He found that families that had taken the polio vaccine were about 50 percent more likely than nonvaccinated families to use seat belts. He also reported that using safety belts might indicate faith in "modern science" and new products. People who expressed unqualified approval of fluoridation of the water supplies were half again as likely to use seat belts as people who did not approve of fluoridation.

Additional support for the preventive health behavior parallel is found in studies by Helsong and Comstock (1977) and by Williams (1972). Williams found that parents who reported using safety belts also tended to report regular dental and medical checkups and other preventive health behaviors. Safety belt use and adequate sleep habits were related moderately. Helsong and Comstock found that people who used safety belts were more likely to report that they had dental checkups and Pap tests than people who did not use them. They also reported that nonuse of safety belts was related to feelings of powerlessness and not being able to change at least some aspects of their lives.

Robertson et al. (1972) reported that seeing a relative or friend injured in an accident was associated with safety belt use. However, personal involvement in accidents did not increase the likelihood of safety belt use. The authors commented that this seeming paradox raises a variety of issues in learning theory and cognitive dissonance.

Robertson et al. also commented on the convenience and comfort features of safety belts which could be improved as one way of improving usage. Bragg (1973) reported that comfort and convenience issues superceded demographic variables, others' opinions of the user and the likelihood of being involved in an accident as factors in use. In fact, several studies in the 1970s were focused on making safety belts more convenient and more comfortable (Breedon & Gordon, 1975; Dahlstedt, 1975; DeGrefte & Paar, 1970; Galer & Dillon, 1976; Gordon, Kondo, & Breedon, 1976; Henderson, 1977; Pierce, Woodson, & Selby, 1974).

### Motorcycle Helmet Use

The American experience with motorcycle helmet use has some parallels with safety belt use and child restraint use. The technology has been developed to reduce the danger of death and injuries in motorcycle accidents by use of a safety device--a helmet. However, the use of a helmet does require action by the user for each trip, they are expensive, and some motorcycle enthusiasts contend they are uncomfortable and interfere with the enjoyment of riding.

In 1966, the first motorcycle helmet laws were passed. Over 40 states had adopted such legislation by the end of 1969. The U.S. Department of Transportation had the power to withhold highway funds from states which did not have motorcycle helmet use laws. However, when the U.S. Department of Transportation moved to use this sanction power against three states which had not complied fully, one of the United States senators representing California led Congress in a move to curtail the department's authority (Livingston et al., 1978). Following the removal of this authority, over 25 states have repealed their helmet laws, and motorcycle deaths have jumped 23 percent in 1977 even though motorcycle registration rose by only 1 percent ("Why Motorcycle Deaths," 1978).

One of the most frequently raised issues in relation to motorcycle helmet laws has been individual rights. In fact, Representative Bud Shuster was quoted during the 1975 House hearings on the department's sanction authority as saying, "In a free country, people have a right to be dumb, do dumb things" ("Why Motorcycle Deaths," 1978, p. 36). Shuster has been reported to be rethinking his position in light of the dramatic rise in motorcycle deaths and injuries. The individual rights issue also has been raised in the courts (Royalty, 1969). In 1972, a Federal District Court in ruling on the constitutionality of the Massachusetts helmet use law gave the opinion that the motorcyclist was required not only to use a helmet for his or her own self-protection but for that of society as well. The opinion included the following statement:

Requiring motorcyclists to wear protective headgear is not violative of due process, notwithstanding claim that police power does not

extend to overcoming the right of an individual to incur risks that involve only himself since the public has an interest in minimizing resources directly involved, in that from the moment of injury, society picks the person up off the highway, delivers him to a municipal hospital and municipal doctors, provides him with unemployment compensation if, after recovery, he cannot replace his lost job, and, if injury causes permanent disability, assumes responsibility for his and his family's continued subsistence. (Simon v. Sargent, 346 F. Supp. 277, 1972)

The U.S. Supreme Court affirmed the district court judge's ruling. The application of this principle of societal "self-protection" to other safety areas could be made as well.

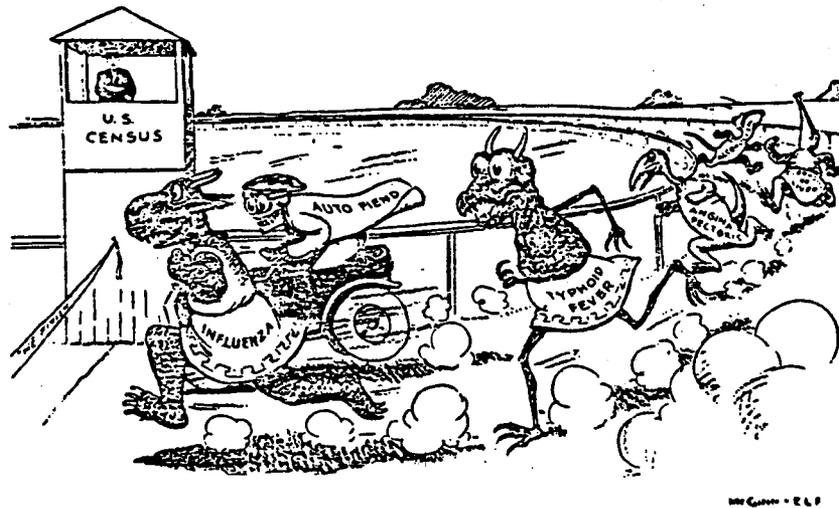
### Other Preventive Health Behaviors

Although the similarity of some of the issues associated with various mandatory vehicle safety regulations is logical, many people are not aware that public health officials have regarded the loss of life from automobile accidents as a preventive health problem for over 45 years. In the cartoon, shown in Figure 11-1, "Mr. Auto Fiend" is shown holding with influenza and typhoid fever as the leading killers of the era. In fact, Stoeckel, Commissioner of Motor Vehicles in Connecticut in 1926, has been quoted as follows:

The traffic accident is part of the public health problem. . . . As compared with smallpox, diphtheria, typhoid or with any other epidemic disease and as compared with accidental injury and death from any other cause, it runs close to the top, with every prospect of heading the list within another year. So its place and right to consideration in every public health movement in the future is assured and those health agencies and organizations which have as their special duty the general supervision of the public health will all take active interest in it. (cited in Rosen, 1975, p. 10)

Both vaccination and fluoridation represented scientific and technological advances and offered protection from some of the greatest enemies to human health. However, both measures were opposed initially on the ideological grounds of individual rights with arguments somewhat similar to those used to oppose mandatory occupant restraint usage. People who advocated acceptance of these measures differed from people who opposed them on several characteristics.

In the early 1900s, vaccination with cowpox as protection against smallpox was recommended for the population of the United States at large. However, Massachusetts had been requiring vaccinations since 1809, and by 1947 over 40 states required them. In what has become the precedent for many of the public health laws today, the United States Supreme Court upheld the constitutionality of the Massachusetts vaccination law on the basis of appropriate use of police power for the community good (Jacobson v. Commonwealth of Massachusetts, 25 S. Ct. 358, 1905). The opinion included the following explanation:



"Mr. Auto Fiend runs neck and neck with Influenza and easily beats Typhoid Fever in the marathon of death." From How to Live, a monthly journal of health and hygiene, August 1929.

FIGURE II-1

"MR. AUTO FIEND" CARTOON

Every person within its jurisdiction does not import an absolute stance, wholly freed from restraint. There are manifold restraints to which every person is necessarily subject for the common good. On any other basis organized society could not exist with safety to its members. Society based on the rule that each is a law unto himself would soon be confronted with disorder and anarchy. Real liberty for all could not exist under the operation of the principle which recognizes the right of each individual person to use his own, whether in respect of his person or his property, regardless of the injury that may be done to others. (Tobey, 1947, p. 239)

Research data on the characteristics of early acceptors of polio vaccinations also bears a resemblance to the information on restraint users. Polio was a dreaded disease of the first half of this century. Medical researchers were jubilant with the promise of the Salk vaccine, which was subjected to its first large-scale use in 1956 ("An End to Polio," 1956).

Glasser (1958) reported that people who had been vaccinated tended to be educated better and to have had higher income levels than people who were not. He found that protected families were informed better about the vaccine and the threat of polio. However, even families which were not protected indicated confidence in the effectiveness and safety of the vaccine. This trust generally was expressed even in spite of the publicity of the "Cutter incident," in which unsafe vaccine was used with negative results. Glasser concluded that people were failing to protect themselves and their children because of procrastination, a feeling that they would not contract the disease, and lack of positive peer pressure.

Winkelstein and Graham (1959) reported that socioeconomic factors and previous experience with poliomyelitis were associated with participation in the field test of the vaccine for the disease in Erie County, New York. Ianni, Albrecht, Boek, and Polan (1960) investigated the characteristics of families who had been vaccinated. They substantiated the general trend for people in higher socioeconomic levels to be vaccinated. However, they noted that the highest rate of protection was found in the second-highest level of social class rather than the highest class and concluded that the "striving" value orientation of the second-highest level was more influential in participation in vaccination than the ability to pay or a technical understanding of its importance.

Fluoridation of water supplies to reduce dental caries represented another technological advancement with substantial benefits for human health if employed. It was discovered that people living in areas with naturally fluoridated water supplies had a much lower incidence of tooth decay (Stallsmith, 1954-55). Fluoridation of municipal water supplies does differ from occupant restraint use, helmet use, and vaccination in that it does not require individual action with each use in order to be effective. Once the community voted to fluoridate the water supplies, no individual action, other than drinking the water, was required. This distinction may have been part of why fluoridation was opposed so vigorously by some people and yet supported so vigorously by others.

The individual rights issue was in the forefront again as community after community waged fierce battles over fluoridation (Gamson, 1961). Stallsmith (1954-55) explored the legal aspects of fluoridation and concluded that the appellate court decisions were correct in upholding the legality of fluoridation on the basis of the police power of the proper legislative bodies.

Characteristics associated with families most likely to support fluoridation were similar to the characteristics associated with the positions and behaviors for other health-related behaviors. Metz (1966) reported that advocates of fluoridation tended to be from families with higher socioeconomic status. He also reported that having a larger number of children in a family was related to parents' favorable attitudes toward fluoridation. However, Masterton (1963) found the likelihood of polio vaccination to be a stronger indicator of favorable attitudes toward fluoridation than either socioeconomic factors or family size.

Attitudes toward public health and medical specialists were investigated by Simmel and Ast (1962). They supported the generalization that higher socioeconomic levels tended to indicate favorable attitudes. However, they also reported that attitudes about physicians were related directly to attitudes toward fluoridation.

Davis (1959) reported that a general lack of understanding of the principles of science contributed to the confusion and controversy over fluoridation. He pointed out that the occasional professional disagreements among scientists leads many people to the conclusion that "science is not only foreign and unnatural but worthless, because it can be used to prove anything, just like statistics" (p. 482). He recommended that public education on the methods and evidence of science be undertaken to facilitate citizens' independent evaluation of scientific innovations.

### Summary

Theory and research findings regarding beliefs with regard to occupant protection systems, motorcycle helmet use, and other preventive health behaviors provide useful insights into the possible relationships among knowledge, attitudes, and behavior of Tennessee parents regarding child passenger protection. The structural variables of how the information is processed by each parent, the content variables of what specific properties the object of the belief may have, and the past and anticipated behavior of the parent probably tend to interact in the formation of the parents' belief systems in relation to child passenger protection.

In investigations of people's belief systems about objects and situations similar to child passenger protection, issues related to comfort and convenience have emerged as components of the decision-making process. Both use of adult restraint systems and use of motorcycle helmets are protective actions which require action on the part of the wearer for each trip. In addition, it has been noted that occupant restraint systems are highly effective in reducing and preventing injuries. In fact, there are parallels between the effectiveness of properly used passenger restraint systems and the effectiveness of polio vaccinations and fluoridation of water supplies. However, the usage

rates for these preventive health behaviors appear to be substantially different. Differences in beliefs and the way they are processed by individual people may account for part of this discrepancy.

### III. METHODOLOGY

The data for the present study were collected as part of the larger Child Passenger Safety Program. Therefore, some aspects of the methodology were derived from that research plan.

#### Hypotheses

It was hypothesized that the beliefs of parents who used child restraint systems with their children would differ from those of parents who did not use them and that the beliefs of parents assessed before the law took effect would differ from those of parents assessed at six months and at one year after the law took effect. It was predicted that the parents who used child restraint devices and those assessed after the law took effect would be more likely to have heard of the Tennessee child passenger protection law, would have more correct knowledge about and to perceive greater effectiveness of the law, would indicate more support for government regulation and adult restraint system use, and would perceive less cost to parents and children associated with use of child restraint devices.

#### Design

A two-way crossed design was used, with use of child restraint devices and assessment time relative to the law taking effect on January 1, 1978, as the independent variables. The two levels of use of child restraint systems were use of a system and failure to use a system. The three levels of assessment time were one prelaw (October/November 1977) and two postlaw periods (first operational period--June 1978, and second operational period--November 1978). The dependent variables were awareness of the law, knowledge of provisions of the law, perceived effectiveness of the law, support for government regulation of automobile occupant protection, support for adult restraint system use, perceived cost to parents, and perceived cost to children.

#### Sample

The population was Tennessee residents who were parents of at least one child under four years of age. The general sample consisted of those parents of small children who were observed by researchers of the Tennessee Child Passenger Safety Program in the five largest urban areas in Tennessee and three small city areas in Tennessee at three points in time. Parents who were accompanied by at least one child under four years of age, who entered a Tennessee shopping center through an observation station, who were interviewed by a project representative, and who were given a self-report questionnaire comprised the subject pool for this study. Only parents of children under four years of age for which all three levels of information (including the completed questionnaire) were available were considered participants in the present study. The size of each sampled group is shown in Table III-1.

A small subsample of six parents observed and interviewed before the law took effect were identified for additional interviewing. This group included three parents who were classified as users and three parents who were

TABLE III-1  
TARGET AREAS AND SAMPLE SIZES

Target Area	Number of Families								
	Prelaw (Baseline)			Postlaw 1 (1st operational period)			Postlaw 2 (2nd operational period)		
	General Sample	Subject pool	Partici- pants	General Sample	Subject pool	Partici- pants	General Sample	Subject pool	Partici- pants
Knoxville	1,207	336	146	776	220	103	734	216	113
Nashville	842	308	135	686	248	129	821	180	91
Chattanooga	869	336	134	674	214	90	569	159	61
Tri-Cities <sup>a</sup>	1,549	362	137	527	198	89	699	166	66
Memphis	841	303	135	531	200	72	631	167	106
Small Cities <sup>b</sup>	976	251	75	511	201	56	565	133	59

<sup>a</sup>Bristol, Johnson City, and Kingsport.

<sup>b</sup>Columbia, Dyersburg, and Morristown.

classified as nonusers. All three user parents were classified as consistent users. Among the nonusers, two parents were consistently nonusers, and one parent was classified as an inconsistent nonuser.

The subjects in the study were primarily from middle-class intact families, with both the level of education and income being higher than the Tennessee average. The mean age was 28.2 years (standard deviation = 5.9. Information on specific sociodemographic characteristics is presented in Table III-2.

### Measurement

Four levels of measurement were employed. Each level was administered to a more restricted sample than the preceding one so that not all of the larger pool of participants at the first level of measurement were included in the succeeding levels. In addition to the differences among levels with regard to restrictiveness of sample, there were also differences regarding the scope of the information obtained.

Instrument development. An interdisciplinary team with the Tennessee Child Passenger Safety Program designed the three interlocking levels of data collection instruments (Tiers 1, 2, and 3) which were used to obtain the quantitative data. The instrument used to obtain the qualitative data (Tier 4) was developed specifically for this project component. Although each level of information can stand independently, the levels were designed so that it was possible to match all the information collected on one family.

Tier 1 was developed as a record for observations of use of child restraint systems and adult restraint system use of the driver (see Appendix B). The vehicle license number was recorded to facilitate matching the three data set levels.

Tier 2 was an interview card and an observation record (see Appendix B). It was designed to collect demographic data and additional information related to use of child restraint systems.

Tier 3 was a completely self-administered questionnaire (see Appendix B). It was designed to collect information on parents' awareness and knowledge of the law, attitudes about restraint system use, attitudes about government regulation, ownership of child restraint systems, and sociodemographic characteristics. The questionnaire included Likert-type items, true-false items, and yes-no items.

The in-depth interview discussion guide (Tier 4) was developed based upon certain sections from the Tier 3 questionnaire (see Appendix B). The interviews were designed to be as informal and free-flowing as possible; therefore, the broad areas on the guide were used to indicate topics to be covered in the interview. The probes are questions which were used to elicit some specific opinions regarding the topics if the discussion did not include them naturally.

TABLE III-2  
 SOCIODEMOGRAPHIC CHARACTERISTICS OF SUBJECT POOL

Category	Number of Respondents <sup>a</sup>
Number of Children <sup>b</sup>	
Children < 4 years of age	
One	56
More than one	154
Children 4 through 17 years of age	
None	11
One or more	31
Education	
Respondent	
Less than high school diploma	389
High school diploma	1,737
Some post-secondary education	872
College degree	613
Graduate degree	252
Mate	
Not applicable (no mate)	122
Less than high school diploma	1,048
High school diploma	1,372
Some post-secondary education	914
College degree	478
Graduate degree	384
Employment	
Respondent	
Full-time employee (outside the home)	2,288
Homemaker	1,026
Unemployed	165
Other (e.g; retired, student, part-time employee)	356
Mate	
Not applicable (no mate)	201
Full-time employee (outside the home)	2,439
Homemaker	697
Unemployed	134
Other (e.g; retired, student, part-time employee)	270

TABLE III-2 (continued)

Category	Number of Respondents <sup>a</sup>
Annual Family Income	
Tier 2 data	
Less than \$5,000	297
\$ 5,000 to \$ 9,999	561
10,000 to 14,999	700
15,000 to 19,999	771
20,000 to 24,999	392
25,000 to 29,999	359
30,000 or more	894
Tier 3 data	
Less than \$5,000	98
\$ 5,000 to \$ 9,999	252
10,000 to 14,999	461
15,000 to 19,999	411
20,000 to 24,999	238
25,000 to 29,999	114
30,000 or more	97

<sup>a</sup>n= 4,697; category totals differ because of missing data.

<sup>b</sup>The format of these items apparently was confusing to many respondents who left them blank.

Data collection. The quantitative data were collected by survey teams in shopping centers in each target area one to two months before the law went into effect and six months and one year after the law went into effect. There was an approximately seven- to eight-month interval between the first two data collection periods and an interval of approximately five to six months between the last two data collection periods. Collection times were primarily on Fridays, Saturdays, and Sundays. A survey team consisted of observers at the Tier 1 level and observer/interviewers at the Tier 2 level. Female interviewers were employed with three or four exceptions.

Observers recorded information on potential subjects as vehicles entered the shopping center. Observers wrote down the subjects' vehicle license numbers and radioed to interviewers to follow vehicles as they parked. Interviewers waited until the vehicle was in a parking place before approaching the adult to ask questions. The observer/interviewer introduced herself and identified that she was working for The University of Tennessee Transportation Center. She asked parents if they would answer a few questions. If the response was yes, the adult was asked if the child in the vehicle was under four years of age and if the adult was the parent or legal guardian of the child. If the child in the vehicle was four years of age or older, the interviewer was instructed to enter a "O" and record the vehicle license number. If the occupants refused to answer any questions, the interviewer wrote "Refused" across the top of the interview card and recorded the vehicle license number.

Parents who agreed to the interview were asked questions about their ownership of child restraint devices. The interviewer asked them to complete questions related to education and income on the reverse side of the Tier 2 card. If the subject refused to answer these questions related to socioeconomic levels, the interviewer wrote "Refused" across the top of this portion of the questionnaire.

Interviewers then handed parents of children under four years of age the Tier 3 questionnaire. They asked the parent to take it home, fill it out, and return it to the Transportation Center. Each Tier 3 questionnaire was handed out in a postage-paid envelope with a cover letter explaining the purpose of the Tennessee Child Passenger Safety Program (see Appendix C). In the letter, parents were told that a free story booklet would be sent to their child if they returned a completed questionnaire. Parents who did not return their Tier 3 questionnaires were mailed a followup letter (see Appendix C) and another copy of the questionnaire. The Tier 3 questionnaires were coded with an identification number which the interviewer recorded on the Tier 2 card. All three levels of quantitative information could be related through the license numbers and Tier 3 questionnaire numbers.

For the Tier 4 data collection, subjects were sent letters asking them to participate in in-depth interviews (see Appendix C). Each family was contacted later by telephone, and an appointment made for an interview. The Tier 4 interview guide was used as the basis of discussion. Each interview lasted approximately one hour.

## Reliability and Validity

The only information from Tiers 1 and 2 that was used for the present study was level of restraint system use and sociodemographic data. Although no formal assessment of validity was obtained for either Tier 1 or Tier 2, the face validity of both is good. The Tier 1 item pertaining to use was recorded by one person. However, interobserver reliability was obtained frequently and unsystematically by a verbal agreement check between the recorder and the other member of that observer team on the perceived level of use. No reliability information was obtained for Tier 2 data.

Tier 3 reliability was checked using Cronbach's alpha. Following preliminary identification of items for use in analysis and construction of the scales, reliability was checked and the scales were revised. The results are listed in Table III-3. Three scales had good reliability. These were perceived effectiveness of the law, support for adult restraint system use, and perceived cost to parents. Two other scales, support for government regulation and perceived cost to child, had acceptable reliability. The remaining scale, knowledge of the law, had relatively low reliability. However, it was retained in the study. One possible explanation of the knowledge of the law scale's relatively low reliability may be related to the fact that the law was passed and became effective only a short while before knowledge was assessed. Another explanation is that, because of the law's provisions imply unsafe behavior and some of the provisions limit the applicable target population, the Tennessee Child Passenger Safety Program has focused public attention on the provisions which imply safe behavior. This selective publicity may have confounded parent's knowledge of the law. Although no formal assessment of validity was obtained for the Tier 3 questionnaire, the face validity appears to be adequate.

The Tier 4 in-depth interview guide was not checked for interviewer reliability. The group of professionals reviewed and evaluated the guide for content and construct validity. Their recommendations were consolidated and incorporated into the final version.

## Operational Definitions

The operational definitions of the independent variables were based upon a combination of information from Tiers 1, 2, and 3. The dependent variables were defined operationally for the quantitative analysis using information derived from Tier 3 data. For the qualitative analysis, the dependent variables were defined operationally using information derived from Tier 4 data.

Use of child restraint systems. Use of child restraint systems was measured in three ways:

1. The first measure was an observation at the Tier 1 level of the vehicle occupants with the child sitting in a child restraint system coded as use of a child restraint system. All other positions while riding in the vehicle were coded as nonuse.
2. The second measure of use at the Tier 2 level also was an observation of the vehicle occupants with the child sitting in a child restraint system coded as use and all other positions in the vehicle coded as nonuse.

TABLE III-3  
RELIABILITY OF THE BELIEF SCALES

Scale	Number of Items	Standardized Alpha
Knowledge of the law	5	.28 <sup>a</sup>
Perceived effectiveness of the law	2	.70
Support for government regulation	3	.62
Support for adult restraint system use	4	.77
Perceived costs to parents	9	.83
Perceived cost to children	4	.57

Note. n = 1,014

<sup>a</sup>Because items for this scale were dichotomous, the alpha for this scale is equivalent to the Kuder-Richardson 20 coefficient of reliability.

3. The third measure of use was a self-report of use by parents. Parents were asked to respond to the following items:
  - a. Out of the last five short trips you took with your child (trip time about 20 minutes or less), how many times did you use a child restraint device with your child?
  - b. Out of the last five long trips you took with your child (trip time one hour or more), how many times did you use a child restraint device with your child?

Respondents were asked to circle the most appropriate number from 0 to 5 for each situation. In order for a response to the third measure to be considered use, a 4 or 5 had to be circled on both items.

A parent was considered a user if the use criterion was met for Tiers 2 and 3 or for Tiers 1 and 3 with missing data for use at Tier 2. If use data were missing for Tiers 1 and 2, the parent was excluded from consideration. A parent was defined as inconsistent with respect to use behavior if the self-report data indicated a level of use different from the level of use observed at Tiers 1 and 2. Inconsistent users were considered as a subcategory of nonusers.

Time of assessment. Data collected before the law took effect on January 1, 1978, were categorized as prelaw. Data collected after the law took effect were categorized as postlaw, with the data of the first operational period collected in June 1978 and data from the second operational period collected during November 1978.

Awareness of the law. For the quantitative analysis, awareness of the law was determined by parents' response to a single yes or no question. This question was: "Have you heard of the Tennessee Child Passenger Protection Act (often called the Child Restraint Law)?"

Knowledge of the law. For the quantitative analysis, knowledge of the law was measured by the number of correct responses to the following five true-false items concerning provisions of the law:

1. Children can be placed in seat belts as a substitute for child restraint devices.
2. Passengers can hold children as a substitute for child restraint devices.
3. The law carries a penalty of a fine.
4. Children riding in a recreational vehicle such as a van or truck do not have to be placed in a child restraint device.
5. The law applies only to children under four years of age.

People indicated their response by circling either true or false. Item 1 is false. The rest of the items are true. This is a 2-point scale on which

respondents were assigned a value of 1 for incorrect and a 2 for correct responses. People who indicated that they had not heard about the law on a separate question earlier in the questionnaire were assigned scores reflecting all incorrect responses. The average of the item responses was used in the analysis. A higher score represented more correct knowledge of the law. If fewer than three items were answered, the variable was counted as missing data.

Perceived effectiveness of the law. For the quantitative analysis, perceived effectiveness of the law was determined by the parents' responses to two items. These items were:

1. A child passenger protection law makes parents more likely to secure their child in a child restraint device.
2. Parents are more aware of the safety needs of children since learning about the law.

Respondents indicated the intensity with which they agreed or disagreed with the statements by circling the most appropriate number on a scale from 1 to 7, with 1 being strongly agree and 7 being strongly disagree. Both items were flipped so that a higher score represented greater perceived effectiveness and a lower score represented less perceived effectiveness. The average of the item responses was used in the analysis. If only one item was answered, the variable was counted as missing data.

Support for government regulation. For the quantitative analysis, support for government regulation of automobile passenger safety to protect citizens was determined by parents' responses to the following three items:

1. Auto regulations infringe on individual rights.
2. There should be a Tennessee state law requiring drivers and passengers to wear seat belts.
3. A child passenger protection law is necessary to protect children who are too young to protect themselves.

Respondents indicated the intensity with which they agreed or disagreed with the statements by circling the most appropriate number on a scale from 1 to 7, with 1 being strongly agree and 7 being strongly disagree. Items 2 and 3 were flipped so that a higher score represented a favorable attitude toward governmental regulations in this area and a lower score represented an unfavorable attitude toward these types of regulations. The average of the item responses was used in the analysis. A higher score represented more support. If fewer than two items were answered, the variable was counted as missing data.

Support for adult restraint system use. For the quantitative analysis, support for adult restraint system use was determined by parents' responses to the following four items related to comfort, convenience, and safety:

1. Seat belts interfere with driving.
2. Seat belts are uncomfortable.
3. Seat belts are a lot of trouble to use.
4. Seat belts are dangerous.

Respondents indicated the intensity with which they agreed or disagreed with the statements by circling the most appropriate number on a scale from 1 to 7, with 1 being strongly agree and 7 being strongly disagree. The average of the item responses was used in the analysis. A higher score represented more support. If fewer than three items were answered, this variable was counted as missing data.

Perceived cost to parents. For the quantitative analysis, perceived cost to parents associated with child restraint system use was determined by parents' responses to the following nine items related to different aspects of obtaining, installing, and using child restraint systems:

1. Child restraint devices are difficult to switch from car to car.
2. Child restraint devices take up a lot of room in the car.
3. It is more trouble to put a child in a child restraint device than it is to hold the child while riding.
4. Children are more trouble when riding in child restraint devices than not riding in child restraint devices.
5. Children resist riding in child restraint devices when there are other people in the car.
6. Child restraint devices are a lot of trouble to use.
7. Child restraint devices are too expensive.
8. Child restraint devices are inconvenient to use.
9. Child restraint devices are difficult to install.

Respondents indicated the intensity with which they agreed or disagreed with the statements by circling the most appropriate number on a scale from 1 to 7, with 1 being strongly agree and 7 being strongly disagree. All nine items were flipped so that a higher score represented higher perceived cost of use and a lower score represented lower perceived cost of use. The average of the item responses was used in the analysis. If fewer than five items were answered, the variable was counted as missing data.

Perceived cost to children. For the quantitative analysis, perceived cost to children associated with child restraint system use was determined by the parents' response to the following four items:

1. Children like to ride in child restraint devices.
2. Most child restraint devices are comfortable for children.
3. A child's willingness to ride in a child restraint device increases with regular use.
4. Children resist riding in child restraint devices.

Respondents indicated the intensity with which they agreed or disagreed with the statements by circling the most appropriate number on a scale from 1 to 7, with 1 being strongly agree and 7 being strongly disagree. Item 4 was flipped so that a higher score represented higher perceived cost to children and a lower score represented a lower perceived cost to children. The average of the item responses was used in the analysis. If fewer than three items were answered, the variable was counted as missing data.

### Analysis

Differences in beliefs of parents in the different user groups and assessment periods were tested using multivariate and univariate analysis of variance (MANOVA and ANOVA) for the continuous variables and chi-square analysis for the discrete variables. Correlations among the dependent variables were computed, along with descriptive statistics for all variables. All subjects for whom the relevant data were available were used for each analysis. A .05 level of significance was used for all inferential tests.

#### IV. RESULTS

Two complementary levels of analysis were conducted. The quantitative results provide information on the beliefs for the large statewide sample. The qualitative results from the small subsample extend some of the concepts which initially were probed in the first level of analysis.

##### Quantitative Analysis

To determine differences in awareness of the law between users and non-users, a chi-square analysis was conducted. As shown in Table IV-1, there was a difference between these groups,  $\chi^2(1) = 19.43$ ,  $p < .0001$ . Users were more likely to be aware of the law than were nonusers. Therefore, the null hypothesis of no differences between user groups was rejected.

To determine differences in awareness of the law between parents relative to time of assessment, a chi-square analysis was conducted. As shown in Table IV-2, there was a difference among these three groups,  $\chi^2(1) = 449.91$ ,  $p < .0001$ . Parents interviewed both 6 months and 1 year after the law took effect were more likely to be aware than parents interviewed before the law took effect. Therefore, the null hypothesis of no differences among groups relative to time of assessment was rejected.

To determine differences in beliefs among the parents in relation to use of child restraint systems, time of assessment and gender of parent, the six belief variables were analyzed by a three-way MANOVA. As shown in Table IV-3, there were no interactions among the independent variables. Therefore, only main effects were considered.

In a one-way MANOVA (collapsed across time and gender), the main effect of use was significant,  $F(6, 942) = 12.24$ ,  $p < .0001$ . As shown in Table IV-4, the dependent variables of perceived cost to parents and perceived cost to children, and support for government regulation made the greatest relative contributions to the variance between the two user groups. However, support for adult restraint system use, knowledge of the law, and perceived effectiveness of the law also made substantial contributions. Users tended to perceive less cost to parents and less cost to children than did nonusers. In addition, they tended to indicate greater support for government regulation and for adult restraint use, greater knowledge of the law, and greater perceived effectiveness of the law than did nonusers.

The one-way MANOVA for main effect of time of assessment period was significant,  $F(12, 2,582) = 10.60$ ,  $p < .0001$ . As shown in Table IV-5, knowledge of the law made the greatest relative contribution to the variance among the groups assessed at different points in time. Results of Duncan's Multiple Range Test confirmed that parents in both postlaw groups had more accurate knowledge of the law than did parents measured shortly before the law took effect. Support for adult restraint system use also was different across the three points in time. As shown by results of Duncan's Multiple Range Test, there was less support at the second postlaw period than at the prelaw period or the first postlaw period.

TABLE IV-1

CHI-SQUARE ANALYSIS FOR RELATIONSHIP BETWEEN PARENTS' AWARENESS OF THE LAW AND USE OF CHILD RESTRAINT SYSTEMS

Awareness	Use	
	Users	Nonusers
Aware of law	269	663
Not aware of law	70	332

Note.  $\chi^2(1) = 19.43, p < .0001.$

TABLE IV-2

CHI-SQUARE ANALYSIS FOR RELATIONSHIP BETWEEN PARENTS' AWARENESS OF THE LAW AND TIME OF ASSESSMENT

Awareness	Time of Assessment		
	Prelaw (Baseline)	Postlaw 1 (1st Operational)	Postlaw 2 (2nd Operational)
Aware of law	277	379	276
Not aware of law	337	41	23

Note.  $\chi^2(1) = 332.77, p < .0001.$

TABLE IV-3

MULTIVARIATE ANALYSES OF VARIANCE FOR DIFFERENCES IN BELIEFS  
 OF PARENTS IN RELATION TO USE OF CHILD RESTRAINT  
 SYSTEMS, TIME OF ASSESSMENT, AND GENDER OF PARENT

Source of Variation	df	F	p
Use	6, 920	8.96	< .0001
Assessment period	12, 1840	4.09	< .0001
Gender	6, 920	5.99	< .0001
Use x assessment period	12, 1840	1.27	< .23
Use x gender	6, 920	1.60	< .15
Assessment period x gender	12, 1840	1.42	< .15
Use x assessment period x gender	12, 1840	.96	< .49

TABLE IV-4

BELIEFS OF PARENTS USING RESTRAINT SYSTEMS AND PARENTS  
NOT USING RESTRAINT SYSTEMS

Variable	Users ( $\underline{n} = 273$ )		Nonusers ( $\underline{n} = 676$ )		$(df = \frac{F}{1}, 947)$	P
	$\bar{X}$	<u>SD</u>	$\bar{X}$	<u>SD</u>		
Knowledge of the law <sup>a</sup>	1.65	.20	1.61	.24	6.67	< .01
Perceived effectiveness of the law <sup>b</sup>	5.60	1.42	5.37	1.55	4.47	< .03
Support for government regulation <sup>b</sup>	5.35	1.29	4.81	1.48	27.37	< .0001
Support for adult re- straint system use <sup>b</sup>	5.37	1.33	4.99	1.42	11.96	< .0001
Perceived cost to parents <sup>b</sup>	3.48	1.25	4.04	1.28	38.01	< .0001
Perceived cost to children <sup>b</sup>	3.13	1.14	3.70	1.19	45.88	< .0001

TABLE IV-5

BELIEFS OF PARENTS FROM ALL SITES ASSESSED BEFORE AND AFTER  
THE LAW WENT INTO EFFECT

Variable	Prelaw (Baseline) ( $\underline{n} = 355$ )		Postlaw 1 (1st operational) ( $\underline{n} = 490$ )		Postlaw 2 (2nd operational) ( $\underline{n} = 454$ )		$(df = \frac{F}{2}, 1,296)$	p
	$\bar{X}$	<u>SD</u>	$\bar{X}$	<u>SD</u>	$\bar{X}$	<u>SD</u>		
Knowledge of the law <sup>a</sup>	1.53 <sup>c</sup>	.26	1.67	.20	1.64	.20	45.92	< .0001
Perceived effectiveness of the law <sup>b</sup>	5.32	1.62	5.51	1.45	5.50	1.44	2.12	< .12
Support for government regulation <sup>b</sup>	4.88	1.60	5.05	1.34	4.95	1.37	1.53	< .22
Support for adult re- straint system use <sup>b</sup>	5.21	1.44	5.19	1.38	4.93	1.39	5.44	< .01
Perceived cost to parents <sup>b</sup>	3.94	1.28	3.80	1.32	3.80	1.34	1.59	< .20
Perceived cost to children <sup>b</sup>	3.53	1.19	3.49	1.16	3.58	1.25	.24	< .78

<sup>a</sup>Scale range = 1-2.

<sup>b</sup>Scale range = 1-7.

<sup>c</sup>Mean different from the other two means at  $p < .05$  as tested by Duncan's Multiple Range Test.

Because differences in beliefs may have been related to the type of information to which parents were exposed in the interim, separate analyses for differences across time of assessment were conducted for sites receiving different kinds of information. During the first operational period, only Nashville received the comprehensive plan, a more intensive media-oriented approach. During the second operational period, Nashville, Knoxville, and Memphis received the comprehensive plan, and the other sites continued to receive the basic state plan.

The results of the belief analysis for Nashville reflected differences across assessment periods,  $F(12, 580) = 5.41, p < .0001$ . As shown in Table IV-6, there was greater knowledge of the law, greater perceived effectiveness of the law, greater support for government regulation, and less perceived cost to children at both times after the law went into effect than before. In Knoxville and Memphis, there also were differences in beliefs across assessment periods,  $F(12, 916) = 5.07, p < .0001$ . As shown in Table IV-7, there was greater knowledge of the law at both postlaw assessment periods than during the prelaw period, but there also was less support for adult restraint system use. In the other sites, there were differences across assessment periods,  $F(12, 954) = 4.16, p < .0001$ . As shown in Table IV-8, these differences were mainly in knowledge of the law, with both postlaw groups having more accurate knowledge than the prelaw group.

### Qualitative Analysis

Differences between users or nonusers in the qualitative analysis were determined on the basis of responses to the in-depth interviews. In general, results of the qualitative analysis were consistent with results of the quantitative analysis.

The user families (1, 2, and 3) represented approximately the same levels of behavioral consistency. One family was characterized at a slightly lower level of consistent use than the other user families. The nonuser families (4, 5, and 6) represented various levels of behavioral consistency. Two of the families were characterized as consistent nonusers. One family was characterized as an inconsistent nonuser.

Family 1. This family was in the middle-income level and had a higher education level than the nonuser families. They had two children. Their daughter was 13 years old, and their son was almost 5 years old. The mother was not employed outside the home. This family was categorized as a consistent user, with use reported at all measurement points.

The mother in this family reported that she believed that even a 25- to 30-mph (40- to 48-km/hr) automobile collision was potentially very dangerous. She reported regular safety belt use for herself and all other members of her family as well as regular use of a child restraint system with her youngest child. She said she felt downright uncomfortable when she had to ride in someone else's automobile when the safety belts did not work. She voiced a particularly strong support for mandatory air cushions as well as other safety regulations.

This mother was very much in favor of legislation and executive regulation of safety belt and child restraint use similar to those for immunizations

TABLE IV-6

BELIEFS OF PARENTS IN NASHVILLE ASSESSED  
BEFORE AND AFTER THE LAW WENT INTO EFFECT

Variable	Prelaw (Baseline) ( $\bar{n}$ = 89)		Postlaw 1 (Comprehensive state plan) ( $\bar{n}$ = 120)		Postlaw 2 (Comprehensive state plan) ( $\bar{n}$ = 89)		(df = $\frac{F}{2}$ , 295)	p
	$\bar{X}$	<u>SD</u>	$\bar{X}$	<u>SD</u>	$\bar{X}$	<u>SD</u>		
Knowledge of the law <sup>a</sup>	1.59 <sup>C</sup>	.20	1.69	.16	1.67	.16	8.76	< .001
Perceived effectiveness of the law <sup>a</sup>	4.99 <sup>C</sup>	1.60	5.68	1.32	5.51	1.43	5.95	< .01
Support for government regulation <sup>b</sup>	4.51 <sup>C</sup>	1.81	5.05	1.39	5.09	1.45	4.16	< .02
Support for adult re- straint system use <sup>b</sup>	5.01	1.53	5.03	1.46	4.67	1.44	1.74	< .18
Perceived cost to parents <sup>b</sup>	4.23	1.09	3.94	1.18	3.82	1.33	2.89	< .06
Perceived cost to children <sup>b</sup>	3.84 <sup>C</sup>	1.15	3.34	1.12	3.56	1.28	4.64	< .01

<sup>a</sup>Scale range = 1-2.

<sup>b</sup>Scale range = 1-7.

<sup>C</sup>Mean different from the other two means at  $p < .05$  as tested by Duncan's Multiple Range Test.

TABLE IV-7

BELIEFS OF PARENTS IN KNOXVILLE AND MEMPHIS  
ASSESSED BEFORE AND AFTER THE LAW  
WENT INTO EFFECT

Variable	Prelaw (Baseline) ( $\bar{n}$ = 108)		Postlaw 1 (Basic state plan) ( $\bar{n}$ = 155)		Postlaw 2 (Comprehensive state plan) ( $\bar{n}$ = 203)		$(df = \frac{F}{2}, 463)$	p
	$\bar{X}$	<u>SD</u>	$\bar{X}$	<u>SD</u>	$\bar{X}$	<u>SD</u>		
Knowledge of the law <sup>a</sup>	1.47 <sup>c</sup>	.29	1.63	.22	1.62	.22	17.39	< .0001
Perceived effectiveness of the law <sup>b</sup>	5.53	1.62	5.34	1.59	5.51	1.53	.67	< .51
Support for government regulation <sup>b</sup>	5.16	1.50	5.14	1.29	5.01	1.36	.62	< .54
Support for adult re- straint system use <sup>b</sup>	5.37	1.42	5.39	1.22	5.05 <sup>c</sup>	1.36	3.53	< .03
Perceived cost to parents <sup>b</sup>	3.81	1.34	3.54	1.37	3.62	1.38	1.34	< .26
Perceived cost to children <sup>b</sup>	3.28	1.32	3.48	1.21	3.38	1.16	.90	< .41

<sup>a</sup>Scale range = 1-2.

<sup>b</sup>Scale range = 1-7.

<sup>c</sup>Mean different from the other two means at  $p < .05$  as tested by Duncan's Multiple Range Test.

TABLE IV-8

BELIEFS OF PARENTS IN CHATTANOOGA, TRI-CITIES, AND RURAL SITES  
 ASSESSED BEFORE AND AFTER THE LAW WENT INTO EFFECT

Variable	Prelaw (Baseline) ( $\underline{n} = 158$ )		Postlaw 1 (Basic state plan) ( $\underline{n} = 215$ )		Postlaw 2 (Basic state plan) ( $\underline{n} = 112$ )		$(df = \frac{F}{2}, 483)$	p
	$\bar{X}$	<u>SD</u>	$\bar{X}$	<u>SD</u>	$\bar{X}$	<u>SD</u>		
Knowledge of the law <sup>a</sup>	1.53 <sup>c</sup>	0.27	1.68	.21	1.65	.20	22.35	< .0001
Perceived effectiveness of the law <sup>b</sup>	5.35	1.62	5.55	1.42	5.50	1.27	.90	< .41
Support for government regulation <sup>b</sup>	4.89	1.49	4.98	1.35	4.88	1.29	.28	< .75
Support for adult re- straint system use <sup>b</sup>	5.22	1.40	5.13	1.43	5.01	1.34	.72	< .49
Perceived cost to parents <sup>b</sup>	3.87	1.31	3.92	1.33	4.05	1.16	.65	< .52
Perceived cost to children <sup>b</sup>	3.54	1.07	3.59	1.15	3.76	1.31	1.27	< .28

<sup>a</sup>Scale range = 1-2.

<sup>b</sup>Scale range = 1-7.

<sup>c</sup>Mean different from the other two means at  $p < .05$  as tested by Duncan's Multiple Range Test.

and other health procedures. She volunteered several questions about this area of concern.

Although she was aware and knowledgeable about the law, this mother was concerned because she did not see high visibility enforcement of the law. She said it would make it easier for her to require friends and relatives to use appropriate restraint practices if she knew getting a ticket or being stopped was highly possible.

This family owned a Peterson child restraint system which the mother had purchased through a department store catalog when she could not locate one locally. The system had been purchased prior to the child's birth and converted to various positions as the child grew. The mother indicated that what she liked best about the system was the shell-like protection offered by the extra plastic shield and high sides. The thing she disliked was the complicated conversion process. She said she had to spend several hours rereading the instructions and spreading the various pieces across the living room floor to get it set up properly.

Family 2. This family was in the middle-income level and had more education than the nonuser families. They had two children. Their daughter was seven years old, and their son was three years old at the time of the interview. The mother was not employed outside the home. This family was categorized as a user, with use reported at all measurement points; the self-report measure of use was slightly lower than those of completely consistent users.

The mother in this family said she knew how dangerous low-speed impacts could be and worried about her children. She recounted her personal experience in a serious automobile accident. She reported wearing her safety belt regularly and her husband's occasional use of his adult restraint system.

This mother was strongly in favor of government regulation of automobile safety, particularly for children. She expressed almost no concern for whether regulations of this type were infringements on individual or familial rights; instead, she commented that some people do not deserve to have children. She also spent a great deal of time talking about needing government regulation in the area of food additives, which can have particularly negative effects on children as well as adults.

Although she was well acquainted with the Tennessee law on child passenger protection, this mother said she was disappointed in the lack of interest in genuine enforcement of the law which would make it more effective. She said she had been stopped recently by an officer who did not even ask her the children's ages or comment on their need to ride restrained (although they were restrained properly at the time). In fact, she said she had been talking with other young mothers with children under four years of age and they all felt it was not being enforced; therefore, they questioned whether the government was serious about the law.

This family had possessed three different child restraint systems. Someone loaned them a General Motors infant seat when the first child was about six weeks old; then they bought a Bobby-Mac for use later, but the mother

said the child outgrew this one too soon. She then purchased a Strolee because it was rated highly in a Consumer Reports article. She basically was pleased with it and the General Motors infant seat. Because the family only owned one automobile, which the father had at work, no observation of the child restraint system was possible.

Family 3. This family was in the middle-income level and had more education than nonuser families. They only had one son, who was 3 years old at the time of the interview. Both parents were employed outside the home. This family was categorized as a user, with use reported at all measurement points; the self-report of use was slightly lower than those of completely consistent users.

The mother in this family expressed mild concern regarding the consequences of an automobile collision. However, she noted that she did not think about an accident happening to her. She felt safe in automobiles but expressed concern about special risks to children; she said she thought using appropriate restraint systems was important for all members of the family. However, she did point out that she and her husband frequently were in too much of a hurry to buckle up unless their son reminded them.

This mother said that she believed it was appropriate for government to take care of children, particularly their health and safety. She commented on the extent to which governments tend to make administrative tangles of things. There were areas of family life in which she felt uncomfortable about governments meddling. Although this mother did not think child passenger safety intervention was necessarily one of those areas, it was not possible to obtain a clearer definition of what she thought those areas would be.

This mother had heard of the Tennessee law, but she did not know much factual information about it. She said it was a good idea but that people were stubborn and lazy and they would not take the time and trouble to obey it.

The child restraint system owned by this family was a General Motors toddler seat, which was a gift from her son's grandparents, who also used one for him in their automobile. She said she liked the padding and elevation so he could see out, but she did not like the tether strap. It was not possible to view the system and its placement in the automobile.

Family 4. This was a middle-income family with only one child. Their son was almost three years old at the time of the interview. The mother was employed outside the home. This family was categorized as a consistent non-user, with nonuse reported at all measurement points.

This mother expressed the belief that both adults and children are safer when riding properly restrained and noted that a 25- to 30-mph (40- to 48-km/hr) crash could be fatal. However, she volunteered the information that neither she nor the child rode using passenger restraint systems. She commented that both adult and child restraint systems were relatively comfortable. She said she knew she should use them but just did not take the time to do so. When asked why she did not take the time to use a child restraint system, she repeated the statement that she just did not.

This mother responded to the question about government regulation of safety practices by confirming the importance of government regulation in promoting safety. She did not believe that government regulation of safety was an infringement of individual or familial rights.

This mother's awareness and knowledge of the law were high. She said she thought the law was a good idea but that parents would not obey it unless it was enforced strongly.

This family owned a Peterson child restraint device that had been obtained as part of a package purchase of nursery furnishings. The mother said she had tried using it when the child was an infant but never could understand how to use it properly. She reported that she had taken the system to work with her one day where she enlisted the assistance of three or four coworkers but still had not been successful in deciphering the procedures for proper use. She still owned the device but had stored it in the child's closet.

Family 5. This family was in the lower-middle-income level and had only one child. Their son was three years old at the time of the interview. The mother was not employed outside the home. This family was categorized as a consistent nonuser, with nonuse reported at all measurement points.

The mother in this family reported that she felt safer riding properly restrained and believed that her child was safer when riding properly restrained. She did believe that it was often uncomfortable for children to ride in child restraint systems and said her husband would not use his adult restraint system because of discomfort.

This mother expressed the belief that government regulation of health and safety was not an infringement on individual or familial rights. She also said that regulation of passenger behavior was not an infringement and that the government needed to make regulations to force parents who would not care for their children properly otherwise to follow some basic guidelines.

Awareness and knowledge of the law were high. The respondent said she had read in the newspaper about the law and why it was passed.

This mother reported that she owned a Bobby-Mac child restraint system. She said she bought it because it was convertible and looked safer than other brands because it had larger plastic side sections to cushion the head area. She reported a dislike of the removable parts and trying to untangle the inside straps, and she said her son could slip his shoulders and torso out of them easily. At the time of the interview, the child restraint system was in the back seat of the car. However, the shield component was not with it, and the inside belts were twisted in such a manner that it appeared as if only portions of the system actually were being used.

Family 6. This family was in the middle-income level and had only one child. Their son was almost four years old at the time of the interview. The mother was not employed outside the home. This family was categorized as an inconsistent user, with nonuse reported at the observation points but a self-report of use on the questionnaire.

The mother in this family responded to the initial question regarding perception of safeness in a 25- to 30-mph (40- to 48-km/hr) automobile collision by recalling her personal experience of being involved in a serious wreck about 10 years ago. She commented that she did not feel all that safe without her restraint system buckled but that she frequently forgot to fasten it. She said her child now reminds her because she required him to sit in his child restraint system.

This mother had generally favorable attitudes toward government regulation of health and safety behaviors, particularly for animals and children. However, she also said she hated rules and being told she had to do anything. She also volunteered the opinion that if the government required people to use child restraint systems, the systems should be made available free to low-income families in a manner similar to free immunization programs.

This mother knew about the law, both its existence and some of its provisions. Although she did voice an objection to being forced to use a child restraint system, she said she thought it was probably a good idea to have a law.

This family owned an old Kantwet-Questor child restraint system. It was received as a gift from grandparents when the child was born, and the mother reported that she had been using it since that time. The things she liked best about the system were the protection and the fact that it elevated the child enough to see out the automobile windows. The mother disliked the inside strap, saying it was a bother to use. In fact, she said that now that her child was 4 years old, she was going to stop using it altogether. At the time of the interview, the child restraint system was in the back seat of the family automobile.

Summary. The most common comment regarding cost to parents associated with use of child restraint systems was related to difficulty in following manufacturers' directions. Nonusers were more likely to comment about costs to children such as discomfort or not being able to see out the windows than were users.

Parents tended to indicate that they believed that government regulation can be appropriate in this area. They were aware of the Tennessee law. Both users and nonusers commented on the apparently weak enforcement of the law at the time of the interviews.

Most of the parents indicated that they believed it was good to wear adult restraint systems. However, some of them commented on the lack of comfort and convenience associated with use of adult restraint systems.

## V. DISCUSSION

An examination of the differences among various types of parental groups regarding their beliefs is one way of developing an improved understanding of the beliefs which may predispose certain groups to specific types of behavior. An examination of differences related to characteristics of the parents (e.g., usage profile) compared to those related to characteristics of the environment (e.g., time and site) can be helpful in identifying conditions which predispose certain groups to specific types of behavior.

### Differences Among Groups in Beliefs

The fact that users versus nonusers and prelaw groups versus postlaw groups differed in their beliefs regarding child passenger protection is consistent with expectations. It may be that the specific components of the belief systems are not the same for all parents in the same group but that the combination of components is interrelated in such a way as to produce similar responses.

Awareness of the law. The fact that users were more likely to be aware of the law than were nonusers may be related to the general level of awareness of news and world events that these parents have. This would be consistent with the communication theory of information diffusion in which people have been described as early adopters (innovators), middle adopters, and late adopters. User parents may represent the early adopter category. People in this category are characterized as open to change and willing to try new experiences. Therefore, they may be more likely to engage in the type of activities which would bring them in contact with information about the new law.

The fact that parents assessed in the postlaw groups were more likely to be aware of the law than were parents assessed in the prelaw group is consistent with expectations because the entire state received some level of public information and education treatment plan after the law took effect. This finding is consistent with results reported by Philpot, Heathington, Sontag, Culler, and Cunningham (1980) indicating that awareness of the law was over 75 percent in a telephone survey of Tennessee residents.

Knowledge of the law. The fact that users had more knowledge of the law than did nonusers is consistent with the finding that users were more likely to be aware of the law than were nonusers. Also this finding may be related to the communication theory regarding information diffusion. In fact, this theory may be relevant particularly to differences in knowledge because innovators may be more likely to retain more new information than do middle or late adopters. This also may be related to the degree of openness or closedness of the parents' information-processing style. Parents with more open styles may be more likely to seek and retain new information than are parents with more closed systems.

Again, the fact that parents in the postlaw group tended to have more accurate knowledge of the law is consistent with expectations because the

entire state was exposed to some level of a public information and education treatment plan after the law took effect. As might be expected, there were differences relative to time of assessment in both the comprehensive plan site and the basic statewide plan sites in regard to knowledge of the law.

Perceived effectiveness of the law. The difference between users and nonusers in their perceptions of the effectiveness of the law is logical. The finding that only in Nashville was perceived effectiveness of the law higher at the postlaw assessment periods also is logical, because this site had the greatest publicity of the law both before and after it went into effect. In addition, enforcement of the law during the first few months after it became effective was almost nonexistent in all sites. This speculation is reinforced by the consistent and strongly voiced observations regarding enforcement which were made by parents who were interviewed.

### Support for Government Regulation

The fact that users tended to indicate greater support for government regulation than did nonusers may be related to a greater consistency between the user parents' values regarding passenger protection and those embodied in the spirit of the Tennessee child passenger protection law than between nonusers parents' values and the law. It may be related also to the user parents' perceptions of societal responsibilities for general health and safety issues. Also, it may be that nonuser parents tend to have more general negative feelings about government, regardless of the specific issues, than do user parents.

The only difference over time in amount of support for government regulation was in Nashville. This difference may be related to the greater perceived effectiveness of the law in that site, a belief which may have been generalized. The fact that Nashville is the state capitol also may be relevant to understanding the greater support for government regulation in that site.

Support for adult restraint system use. The fact that user parents tended to indicate greater support for use of adult restraint systems may be related to their level of use of adult restraint systems. This would be consistent with previous research on the relationship of parental use of an adult restraint system to use of a child restraint system. Perry, Heathington, Philpot, Pentz, and Lo (1980) found that parents who used child restraint systems were more likely to be using their own restraint systems than were parents who were not using child restraint systems.

Although there was not a difference over time in support for adult restraint system use for the total sample, there was less support in Knoxville and Memphis at the second postlaw period than at the previous assessment points. Although this result seems somewhat inconsistent with other findings, there may be several possible explanations. There may have been less support for adult restraint system use, perhaps because of overgeneralization of information about dangers of safety belt use with small children or a passive aggressive response to "forced" use of restraint devices with children. On the other hand, this apparent difference may reflect a shift in the population sampled. Users were more likely to return their questionnaires than were

nonusers and as usage increased, a broader segment of the population-- including more parents who are less passenger-safety conscious--may have been represented.

Perceived cost to parents. The fact that nonusers perceived greater cost to parents associated with use of child restraint systems is particularly noteworthy because both the quantitative variable and the qualitative questions were composites of various types of costs, such as difficulty of use, in addition to financial costs. In the in-depth interviews, both users and nonusers reported perceptions of substantial cost to parents. It may be that although users do perceive cost to themselves, they place different values on overcoming the costs than do nonusers. Also, it is possible that users have developed more successful strategies for coping with the cost and therefore perceive the impact of these costs less than do users.

The fact that parents interviewed in the postlaw groups did not perceive less cost to themselves than did parents interviewed in the prelaw group may be related to the length of time required to change a belief of this nature. With greater experience, parents may perceive less cost to themselves. However, to some extent parents' responses probably reflect a realistic assessment of the time, money, effort, and skills that actually are required with child restraint system ownership and use.

Perceived cost to children. The fact that, in both the quantitative and qualitative analyses, nonusers perceived greater costs to children associated with use of child restraint systems than did users further substantiates the importance of comfort and convenience issues in passenger protection. It may be that, although users do perceive costs to children associated with the use of child restraint systems, they place different values on overcoming the costs than do nonusers. Also, it may be that users tend to employ different strategies for childrearing and behavior management than do nonusers. Regardless of how much of a real barrier comfort and convenience factors present to use of child restraint systems, the fairly widespread folklore regarding childrens' preferences and behavior make them more socially acceptable barriers to use than some of the other reasons parents might have.

The fact that parents interviewed after the law took effect did not differ from parents interviewed before the law took effect may be related to the length of time required for a belief of this nature to change. It also may be related to the type of information to which the parent was exposed in the interim. In Nashville, where the comprehensive public information and education treatment plan was implemented first, parents who were interviewed in the postlaw groups tended to report less perceived cost to children associated with use of child restraint systems than did parents in the prelaw group. Thus, there is some evidence of the effectiveness of educational intervention in altering parents' perceptions of the value of using child restraint systems.

#### Limitations of the Present Study

Although some of the results from the present study are relatively clearcut, it is important to interpret all the results in relation to various limitations of the study. Some of these limitations are ones stemming from the

larger study within which these data were collected, but others are associated with this specific study.

The present study was focused on a limited number of beliefs about passenger safety. The inclusion of beliefs more related to general health and safety, parenting, and driving responsibilities in the quantitative analysis might have contributed additional information on the patterns of beliefs, particularly those related to behavior changes.

Also, because the families in the study were observed only at one point in time, intrafamilial changes could not be measured. A longitudinal design would have permitted the collection of more information on the changes within the same families over time. This design would have yielded a different kind of information than the present study and might have contributed to a better understanding of the contributing factors associated with changes in systems.

Some of the limitations associated with this study arise from the sample which was used. A nonrandom availability sample of parents was obtained from shopping centers on Fridays and weekends at designated times for the quantitative sample. Also, users probably were overrepresented in the group of respondents to the Tier 3 mail-back questionnaire; bias in mail-back questionnaires usually is in the direction of higher socioeconomic status of the respondents. The sample for the qualitative analysis was drawn only from the prelaw assessment group in a basic statewide public information and education treatment plan target area. Therefore, no in-depth interviews with parents from the postlaw assessment group or the comprehensive public information and education treatment plan site were included. Furthermore, because the interviews were conducted approximately a year after the law took effect, the possible impact of the law must be considered.

The sample size for the quantitative analysis was quite large; in fact, finding differences between groups was more likely than would have been the case if a smaller sample has been used. However, missing data for many of the respondents (perhaps an unrepresentative subset of the sample) reduced the size of the sample used in the analysis considerably. For the qualitative analysis, the sample size was extremely small; discussions with a larger number of parents might have revealed more and/or different information than was obtained in the present study.

Observations of level of use may have had limitations in validity. Because observations of use for each family were made on the same day, no data on the consistency of use were available. The other data on use were on parents' reports of use habits on the mail-back questionnaire and therefore are subject to the well-known qualifiers associated with the interpretation of self-reports. This is particularly noteworthy because self-reports tend to be in the direction of what is perceived to be the most socially desirable answers. In addition, responses of parents on the mail-back questionnaire may have been influenced by interaction with the research staff in the initial contact. Thus, both reliability and validity of measures used in this study might be improved.

A final limitation concerns the unit of analysis for the study. Although the family was the unit of analysis, the sample did not include the whole family. It is not known whether only one or both parents participated in completing the questionnaire. It also is not known whether the same persons were involved for each family at each point of the data collection. A better understanding of the attitudes and behaviors with respect to child passenger protection could be obtained from an examination of the total family system.

## VI. CONCLUSION

The results of the present study contribute to an improved understanding of parents' belief systems in relation to child passenger protection. A framework for a theoretical model emerged as well as implications for practitioners and suggestions for future research.

### Development of a Theoretical Model

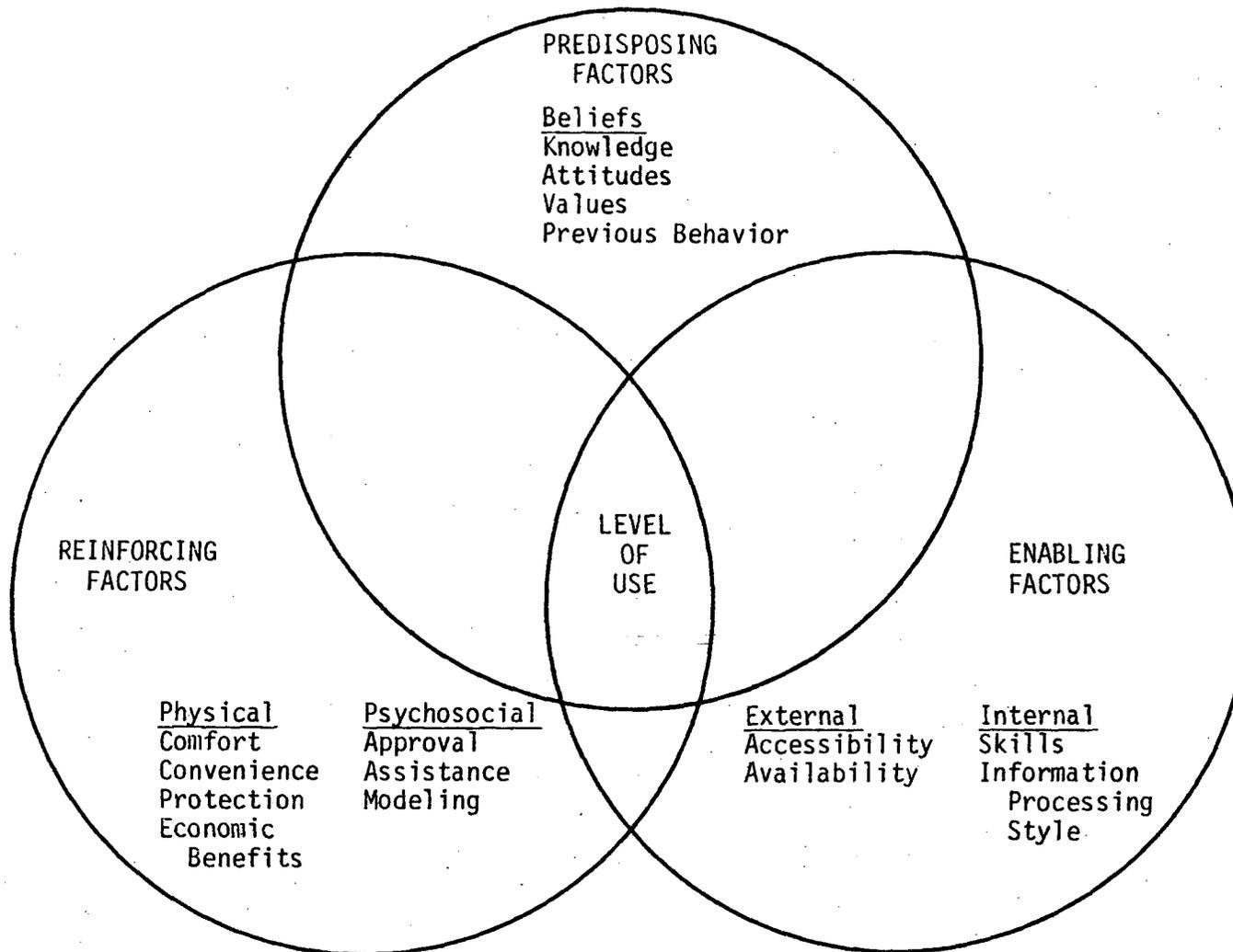
As the present study progressed, the concepts of Rokeach's (1972) model of the interrelationships of knowledge, attitudes, and behavior which was used to form the definition of belief employed in the research were integrated with the concepts which emerged in the literature review and analysis of results. This integration resulted in the development of a model derived from Green's (1976) framework for diagnosing health education needs (Hughes, 1979). The model which was developed to assist in the consideration of the different components of the child restraint system usage decision is shown in Figure VI-1. It consists of three broad categories called predisposing factors, enabling factors, and reinforcing factors.

Model components. The predisposing factors are those attributes which cause a person to be inclined toward a particular thing or type of action. This category includes the components of beliefs which are knowledge, attitudes, values, and past behavior.

Enabling factors are those characteristics associated with both the external and internal resources which a person can use to accomplish a particular thing or type of action. This definition includes characteristics of the parent such as information-processing style and skills as well as external characteristics related to accessibility and availability of things which a person needs in order to accomplish something or exhibit a particular type of action.

Reinforcing factors are those factors associated with the physical and psychosocial environment which influence belief systems (including behavior) in either relatively positive or relatively negative ways. This component includes such physical attributes as the amount of comfort associated with certain objects or actions. It also includes psychosocial attributes such as the approval of significant others, the observation of other peoples' behaviors, and assistance received from other people. Also, the perception of society's values in regard to certain objects or actions may be influenced particularly through the values portrayed in television programming, newspaper articles, and magazines. A law or other legal provision would have both psychosocial and physical attributes because simultaneously it could represent societal values related to the subject and through fines serve as a cost associated with certain behaviors.

Application to present study. The present study was focused on what may be categorized as predisposing factors associated with child passenger safety in Tennessee. The specific components of beliefs which were targeted



Source: Hughes, E.C., Child Passenger Protection: Knowledge, Attitudes, and Behavior of Tennessee Parents. Knoxville, Tennessee: Transportation Center, The University of Tennessee, 1979.

FIGURE VI-1

CHILD RESTRAINT SYSTEM USAGE DECISION MODEL

included knowledge (one component of which is awareness), attitudes, and behavior. The attitudes primarily were those related to the reinforcing and enabling factors such as comfort and convenience issues.

Some positive physical attributes could include having some experience with the protective benefits of use, liking the way the child restraint systems look, and experiencing fewer behavior management problems. Negative physical attributes would be such things as being inconvenienced by the amount of space occupied by the system in the vehicle. Psychosocial attributes would include approval/disapproval from friends, grandparents, spouses, and/or children.

The financial cost of a child restraint system may be more than a parent can afford to pay. Also, parents with better skills at following written instructions and mechanical skills may perceive less "hassle" than other parents. These skills may enable them to operationalize their favorable attitudes, beliefs, and knowledge more easily. Also, they may process information in ways which contribute to ease or difficulty in forming new belief systems.

The area of overlap among all three categories of factors may indicate the most consistent and extreme types of use behavior. For example, consistent use may result from the combined influence of some dimensions of all three categories in a sufficiently powerful way to cause the parent to decide in favor of use. The opposite may be true for consistent nonusers.

The interaction among the categories might contribute to an explanation of why some owners of child restraint systems are inconsistent users. For example, family members may have all the predisposing factors and enabling factors in a configuration favorable to child restraint device use. In fact, they may even own a system but not use it regularly because most of the reinforcing factors are neutral or even negative. They may be motivated to use the system if other people who are riding with them positively reinforce it and/or on occasions when they perceive a greater likelihood of an accident, such as a rainy day.

Implications of present study. The present study supports the position that certain attitudes may be associated differently with different behaviors. It also supports the position that beliefs may change in association with changes in the external environment.

The information generated regarding the differences in the beliefs of parents in the different assessment periods supports the theoretical model of belief and more specifically behavior change on which this investigation was based. Awareness and knowledge could be predicted to change first. Attitudes and behavior could be predicted to change after awareness and knowledge change. This raises the question of what the length of time and the intensity of the treatments must be in order to observe differences in the other beliefs.

From the present study support can be established for the position that higher socioeconomic status implies the presence of a powerful group of factors associated with acting upon predisposing factors. The importance of the perceived cost to parents lends support to the position that assessment of environmental or situational costs associated with objects is a factor in the development of belief systems regarding those objects. Lowering these costs--for example, through design of more convenient child restraint systems--can be an important means of changing behaviors such as restraint usage.

The present study lends support to the position that public policies can make a difference in beliefs. However, because knowledge of the law was the variable that made the greatest contribution to the variation between the pre-law and postlaw groups, this raises the question of how policies and significant others reinforce behaviors analogous to child passenger protection.

Although many parents' usage behavior was inconsistent in the present study, the interaction among the three categories of factors may provide some explanation of this tendency. The areas in the model where only two categories overlap provide the basis for questions concerning the relative contribution of each category to the use decision for a particular individual and how that decision regarding level of use is determined. This may provide useful information about individual and group decision-making strategies as well.

#### Implications for Practitioners

The differences in levels of external enabling factors is an area of research with special relevance to policymakers. If the interaction among all three categories of factors is important in influencing consistent use of child restraint systems, then this becomes particularly important. Availability is the first level of the problem. A parent has to locate and buy an extra device in order to protect the child. If a system appropriate for infants and small children were already in the car or given to the car owner at the point of purchase, the potentially negative impacts of the availability factor could be ameliorated.

Also, accessibility is currently a problem because the systems are so expensive. The development of distribution programs such as loaner programs to reach wider audiences should help moderate the potentially negative impact of this factor. Products which would facilitate continued proper use should be promoted. Educators should place additional emphasis on the development of decision-making and problem-solving skills.

Policymakers, educators, and parents need to structure the social environment so that, in addition to communicating factual information, they are fostering a reinforcing atmosphere for user behavior. Television shows are major socializers of both children and adults and should portray safe occupant restraint behavior as the norm.

In addition to automobiles, other forms of public transportation which currently do not reinforce the "buckle-up" habit need to be reassessed. For example, when children get in a taxicab or a school bus and there are no passenger restraint systems, the usage habits which could someday save their

lives are not reinforced because there is not an expectation that the children will use their restraint systems. The value of making the transportation systems consistent, either by providing passenger restraint systems or by furnishing information on where or when they may not be necessary, helps resolve the inconsistency which otherwise may be introduced.

### Suggestions for Further Research

The differences in belief systems between users and nonusers need to be considered in order to determine their possible contribution to developing effective strategies for converting nonusers into users and for maintaining desirable user behavior. Two areas in particular which may be fruitful for further research are perceived cost to parents and perceived cost to children associated with use of child restraint systems. Additional research concerning consumer satisfaction with specific types and brands of adult restraint systems may be helpful in identifying features of child restraint systems which could decrease the cost of use and increase the probability of use. There are many more owners of child restraint systems than there are users. These parents have been influenced to buy but not to use. It might be beneficial to have research on the purchase-then-use pattern associated with other health-related items like exercise equipment.

Another area for further investigation is the role of knowledge and awareness of the law in relation to beliefs. Although there is a relationship between awareness and knowledge, the expectation that parents who are more knowledgeable about automobile passenger protection and the law also may be more likely to have more favorable beliefs about general health and safety needs, children, and public policies than other parents merits additional consideration.

Both the quantitative and qualitative information reflected the contribution that perceived cost to parents made to the difference between users and nonusers. In addition to financial costs, the costs associated with lack of skills in problem solving that may affect the ability and perseverance to follow the manufacturers' instructions merit further attention. Also, the information-processing styles of the parents which are related to how they form and reorganize their belief systems need to be investigated.

Further studies to explore the role of the social desirability factor in reporting both reasons for use and nonuse of child restraint devices need to be conducted. Without a better understanding of how this factor operates in parents' communication of their behavior regarding child passenger protection, the focus of strategies designed to encourage use may be misdirected.

Also, future research on the contribution of whole family decision-making behavior regarding child passenger protection would contribute toward a better understanding of effectiveness of public information and education programs. Specifically, an investigation of fathers' beliefs and roles in the purchasing and usage decision in conjunction with those of mothers would be helpful.

Additional attention to who the reinforcing agents are and what they are reinforcing needs to be followed up by the traditional journalists' questions of who is being reached, what message, when, where, and how communicated. The literature in the area has been focused primarily on health care providers with mixed reports of success. Research on reinforcement by peers, neighbors, employers, and educators needs to be conducted.

Furthermore, additional investigations of public reaction to policies regarding use need to be conducted. These should include the judicial and executive agency/regulatory policies as well as the legislative. In Tennessee, research on public reaction to increasing levels of enforcement would be meaningful on several dimensions. To examine usage, increases that have paralleled greater enforcement of the law, follow-up studies need to be conducted to determine changes in other belief dimensions. Because a law represents at some level a societal value on the subject, amendments to the Tennessee law (e.g., removing loopholes) represent a change in beliefs from 1977. The circumstances surrounding such change should be investigated. Because the directions of interaction have not been established between categories of factors in the decision model, it is extremely important that directors of public information and education programs exchange experiences in order to facilitate early identification of successful strategies. Then additional research should be conducted to determine more accurately the combination of factors which resulted in the successes.

In summary, additional research should be focused on the complex interaction of the various factors associated with child passenger protection behavior. The present study has resulted in further elaboration of some of the factors associated with child passenger protection. Specifically, additional information has emerged regarding the belief systems of Tennessee parents in relation to child passenger protection which may contribute to the development of more effective and efficient strategies for public information and education programs, public policies, and child restraint system designs. However, continued attention needs to be devoted to research directed toward understanding beliefs of parents and the larger society if the child passenger protection problem is to be solved.

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## APPENDIX A

### TENNESSEE CHILD PASSENGER PROTECTION LAW

59-930. Safety belts and child passenger restraint systems required—Violations—Penalties.—(a) It shall be unlawful for any person to buy, sell, lease, trade or transfer from or to Tennessee residents, at retail, an automobile which is manufactured or assembled commencing with the 1964 models, unless such automobile is equipped with safety belts installed for use in the left front and right front seats thereof. All such safety belts shall be of such type and be installed in a manner approved by the department of safety of the state of Tennessee. The department shall establish specifications and requirements of approved types of safety belts and attachments. The department will accept, as approved, all seat belt installations and the belt and anchor meeting the specifications of the Society of Automotive Engineers. Provided that in no event shall failure to wear seat belts be considered as contributory negligence, nor shall such failure to wear said seat belt be considered in mitigation of damages on the trial of any civil action.

(b) Effective January 1, 1978, every parent or legal guardian of a child under the age of four (4) years residing in this state shall be responsible, when transporting his child in a motor vehicle owned by that parent or guardian operated on the roadways, streets or highways of this state, for providing for the protection of his child and properly using a child passenger restraint system meeting federal motor vehicle safety standards, or assuring that such child is held in the arms of an older person riding as a passenger in the motor vehicle. Provided that the term "motor vehicle" as used in this paragraph shall not apply to recreational vehicles of the truck or van type. Provided further that the term "motor vehicle" as used in this paragraph shall not apply to trucks having a tonnage rating of one (1) ton or more. Provided that in no event shall failure to wear a child passenger restraint system be considered as contributory negligence, nor shall such failure to wear said child passenger restraint system be admissible as evidence in the trial of any civil action.

(c) Violation of any provision of this section is hereby declared a misdemeanor and anyone convicted of any such violation shall be fined not less than twenty-five dollars (\$25.00) nor more than fifty dollars (\$50.00) for each violation of subsection (a) of this section and not less than two dollars (\$2.00) nor more than ten dollars (\$10.00) for each violation of subsection (b) of this section. [Acts 1963, ch. 102, §§ 1, 2; 1977, ch. 114, §§ 1, 2.]

**Amendments.** The 1977 amendment designated the former first paragraph as subsection (a), the former second paragraph as subsection (c), added subsection (b) and added the material at the end of subsection (c) following "fifty dollars for each violation."

**Effective Dates.** Acts 1977, ch. 114, § 3. January 1, 1978.

**Law Reviews.** Ellithorpe—Adoption of Crashworthiness Via Strict Products Liability (Gail O. Mathes), 4 Memphis State U. L. Rev. 497.

**Cited:** Ellithorpe v. Ford Motor Company (1973), — Tenn. —, 503 S. W. (2d) 516.

#### NOTES TO DECISIONS

##### 1. Contributory Negligence.

Failure to wear seat belts does not constitute contributory negligence in Tennessee. *Mann v. United States* (1968), 294 Fed. Supp. 691.

In wrongful death action where defendant's automobile, after failing to yield right-of-way, struck the decedent's vehicle, an instruction as to possible

remote contributory negligence of decedent because of his failure to wear a seat belt was precluded by the proviso in this section that states that a failure to wear seat belt shall not be considered contributory negligence. *Stallcup v. Taylor* (1970), 62 Tenn. App. 407, 463 S. W. (2d) 416.

APPENDIX B  
TIER QUESTIONNAIRES

Child Passenger Safety Program  
TIER 1  
Data Sheet

1. Child(ren) under four years of age

Child #1	Other Child(ren)
----------	------------------

- |                          |                          |                      |
|--------------------------|--------------------------|----------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | 1. In CRD            |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. Held by Passenger |
| <input type="checkbox"/> | <input type="checkbox"/> | 3. Held by Driver    |
| <input type="checkbox"/> | <input type="checkbox"/> | 4. Other             |

2. Seat Belts in use (Driver Only)

- |                          |                 |
|--------------------------|-----------------|
| <input type="checkbox"/> | 1. Yes          |
| <input type="checkbox"/> | 2. No           |
| <input type="checkbox"/> | 3. Undetermined |

3. License Number \_\_\_\_\_

Date \_\_\_\_\_

Code:

CHILD PASSENGER SAFETY PROGRAM

TIER 2

Data Sheet

QUESTIONS ASKED OF SUBJECT

1. Child(ren) younger than 4

( # of )

Child (under 4)	Birthdate mth/yr	Sex		Driver's Relation to Child			
		F	M	Par.	Rel.	Friend	Other
#1							
#2							
#3							

2. Year of car 19\_\_

3. If CRD is not present

Do you own a CRD?

1. Yes \_\_\_\_\_ brand \_\_\_\_\_ type
2. No

4. If CRD is present

- a) What Brand? #1 \_\_\_\_\_
- (if more than 1) #2 \_\_\_\_\_

OBSERVED ITEMS

4. b) Type

- #1 #2
1. Infant Carrier
2. Protective Shield
3. Car Seat
4. Safety Harness

c) Is CRD federally approved?

- #1 #2
1. Yes
2. No
3. Undetermined

d) location

- #1 #2
1. Back seat
2. Front seat
3. Cargo area

e) Was CRD used?

- #1 #2
1. Yes
2. No
3. Undetermined

f) When use was observed

- #1 #2
1. Before Removal
2. Demonstrated
3. Not viewed

g) Usage

- #1 #2
1. Proper
2. Improper
3. Undetermined

5. Passengers 4 and older

a) \_\_\_\_\_ children (4-17 yrs.)

(# of)

b) \_\_\_\_\_ adults

(# of)

6. Driver

Sex:  F  M

7. If the respondent is not the driver, what sex?

F  M

8. Seat Belts Used (driver only)

yes  no  unknown

9. Vehicle Information

a) Body Style

1. 2 door sedan
2. 4 door sedan
3. 2 door station wagon
4. 4 door station wagon
5. Pickup/van
6. Other \_\_\_\_\_

b) Size

1. Subcompact
2. Compact
3. Full size

c) Make \_\_\_\_\_

d) License Number \_\_\_\_\_

Tier 3 # \_\_\_\_\_

Date: \_\_\_\_\_

Code:

Participation in this survey is completely voluntary. Only summary data will be reported. All individual responses will be confidential. You may withdraw your participation at any time. If you have any questions about the program you may call the Transportation Center 974-5255.

1. Do you (or your mate) own this car?

- 1. Yes
- 2. No

2. How many cars do you and your mate own?

- 1. One
- 2. Two
- 3. Three or more

3. Were the driver and the passengers over 4 years of age wearing seat belts?

- 1. Yes, all were
- 2. Some passengers were
- 3. No, none were

4. What is your marital status?

- 1. Married/living with a mate
- 2. Single/living without a mate

5. How many children do you have?

	Number living at home	Number not living at home	Children
a.	_____	_____	Under 4 years
b.	_____	_____	4-17 years
c.	_____	_____	18 years or older

6. What was your family income last year before taxes? (If you are single/not living with a mate, what was your personal income?)

- 1. Less than \$5,000
- 2. \$5,000 to \$9,999
- 3. \$10,000 to \$14,999
- 4. \$15,000 to \$19,999
- 5. \$20,000 to \$24,999
- 6. \$25,000 to \$29,999
- 7. \$30,000 or more

7. What is your employment status? (Check only one)

- 1. Employed full time, outside home
- 2. Employed part time, outside home
- 3. Retired
- 4. Homemaker
- 5. Student
- 6. Unemployed
- 7. Other \_\_\_\_\_  
(please specify)

8. What is your mate's employment status? (Check only one)

- 0. No mate
- 1. Employed full time, outside home
- 2. Employed part time, outside home
- 3. Retired
- 4. Homemaker
- 5. Student
- 6. Unemployed
- 7. Other \_\_\_\_\_  
(please specify)

9. What is the highest level of education you have completed?

- 1. No formal schooling
- 2. Less than High School
- 3. High School or G.E.D.
- 4. Vocational or Technical School
- 5. Some college
- 6. College degree
- 7. Graduate degree

10. What is the highest level of education your mate has completed?

- 0. No mate
- 1. No formal schooling
- 2. Less than High School
- 3. High School or G.E.D.
- 4. Vocational or Technical School
- 5. Some college
- 6. College degree
- 7. Graduate degree

### Tier 3 Data Questionnaire

Please indicate your response to the following statements by circling the number in the column which most closely represents the extent to which you agree or disagree.

	STRONGLY AGREE						NEUTRAL						STRONGLY DISAGREE
1. Auto safety regulations infringe on individual rights.	1	2	3	4	5	6	7						
2. Seat belts interfere with driving.	1	2	3	4	5	6	7						
3. Seat belts are uncomfortable.	1	2	3	4	5	6	7						
4. There should be a Tennessee state law requiring drivers and passengers to wear seat belts.	1	2	3	4	5	6	7						
5. Seat belts are a lot of trouble to use.	1	2	3	4	5	6	7						
6. Seat belts are dangerous.	1	2	3	4	5	6	7						
7. Seat belts are as safe as child restraint devices for children between two and four years of age.	1	2	3	4	5	6	7						
8. The state of Tennessee should take a more active role in protecting children's welfare.	1	2	3	4	5	6	7						
9. A small child who is held by a passenger in a car is safe.	1	2	3	4	5	6	7						
10. Child restraint devices are difficult to switch from car to car.	1	2	3	4	5	6	7						
11. Children like to ride in child restraint devices.	1	2	3	4	5	6	7						
12. Older children are more willing than younger children to ride in child restraint devices.	1	2	3	4	5	6	7						
13. Child restraint devices take up a lot of room in the car.	1	2	3	4	5	6	7						
14. It is more trouble to put a child in a child restraint device than it is to hold the child while riding.	1	2	3	4	5	6	7						
15. Parents are more likely to use a child restraint device when driving over 40 m.p.h. than when driving more slowly.	1	2	3	4	5	6	7						
16. Most child restraint devices are comfortable for children.	1	2	3	4	5	6	7						
17. Children are more trouble when riding in child restraint devices than when not riding in child restraint devices.	1	2	3	4	5	6	7						
18. Mothers are more likely than fathers to secure their children in child restraint devices.	1	2	3	4	5	6	7						
19. Children are more likely to fight with one another when they are not seated in restraint devices.	1	2	3	4	5	6	7						
20. Children resist riding in child restraint devices when there are other passengers in the car.	1	2	3	4	5	6	7						
21. Child restraint devices are a lot of trouble to use.	1	2	3	4	5	6	7						
22. Child restraint devices are too expensive.	1	2	3	4	5	6	7						
23. A parent is more likely to use a child restraint device when there is no one else in the car.	1	2	3	4	5	6	7						
24. Parents are more likely to use a child restraint device when driving long distances than when driving short distances.	1	2	3	4	5	6	7						
25. Child restraint devices are inconvenient to use.	1	2	3	4	5	6	7						
26. Child restraint devices are difficult to install.	1	2	3	4	5	6	7						
27. Parents should make their child ride in a child restraint device.	1	2	3	4	5	6	7						
28. A child's willingness to ride in a child restraint device increases with regular use.	1	2	3	4	5	6	7						
29. Children resist riding in child restraint devices.	1	2	3	4	5	6	7						
30. Instructions that come with child restraint devices are easy to follow.	1	2	3	4	5	6	7						

31. Have you heard of the Tennessee Child Passenger Protection Act (often called Child Restraint Law)?

- 1. Yes
- 2. No (If No, Skip to Question 35.)

32. Indicate whether you think the following statements about the law are true or false by circling the number in the appropriate column.

	True	False
a. The law applies to anyone transporting children.	1	2
b. Children are to be secured in federally approved child restraint devices.	1	2
c. Children can be placed in seat belts as a substitute for child restraint devices.	1	2
d. Passengers can hold children as a substitute for child restraint devices.	1	2
e. The law carries a penalty of a fine.	1	2
f. Children riding in a recreational vehicle such as a van or truck do not have to be placed in child restraint devices.	1	2
g. The law applies only to children under four years of age.	1	2

33. (a) Where did you receive information about the law? Circle the number in the appropriate column.

	Yes	No
1. From the newspaper.	1	2
2. From television.	1	2
3. From radio.	1	2
4. From a billboard.	1	2
5. From a club or organization.	1	2
6. From your doctor's office.	1	2
7. From a pamphlet or brochure.	1	2
8. From a friend.	1	2
9. From a school program.	1	2
10. From a hospital.	1	2
11. From where you work.	1	2
12. Other (Please specify) _____		

(b) Underline the source above which was most informative (example, From radio).

34. Please indicate your response to the following statements by circling the number in the column which most closely represents the extent to which you agree or disagree.

	STRONGLY AGREE	NEUTRAL	STRONGLY DISAGREE
a. A child passenger protection law makes parents more likely to secure their child in a child restraint device.	1 2 3	4 5 6	7
b. Parents are more aware of the safety needs of children in cars since learning about the law.	1 2 3	4 5 6	7
c. Parents will not use a child restraint device unless there is a fine for violating the law.	1 2 3	4 5 6	7
d. Parents will comply with the child passenger protection law only if it is strictly enforced.	1 2 3	4 5 6	7
e. A child passenger protection law is necessary to protect children who are too young to protect themselves.	1 2 3	4 5 6	7

35. Do you own a child restraint device?

- 1. Yes (If yes, skip to question 37)
- 2. No

36. Why do you NOT own a child restraint device? (Check (✓) all the reasons that apply.)

- a. I did not know they were available.
- b. They are too expensive.
- c. My child does not like them.
- d. I have not gotten around to getting one.
- e. They are too difficult to install.
- f. They are too much trouble to use.
- g. They take up too much room in the car
- h. I use a seat belt with my child.
- i. I did not realize my child needed one.
- j. Other \_\_\_\_\_

(Please specify.)

If you DO NOT OWN a child restraint device, skip to question 40.

37. a) How many child restraint devices (CRD) do you own? (Circle the appropriate number.)

1            2            3

b) How did you obtain the child restraint device(s) that you are currently using?  
(Check (✓) the appropriate item.)

CRD #1    CRD #2(if more than one)

- 1. Purchased from a car dealer.
- 2. Purchased at a department, discount, or children's specialty store.
- 3. Purchased second hand.
- 4. Received second hand from a friend or relative.
- 5. Received a new one as a gift.
- 6. Received on loan from an organization.
- 7. Other \_\_\_\_\_

(Please specify)

c) Approximately how many months have you had the child restraint device(s)?

CRD #1 \_\_\_\_\_ CRD #2 \_\_\_\_\_

d) Approximately how many months old was your child when you first began using the child restraint device(s)?

CRD #1 \_\_\_\_\_ CRD #2 \_\_\_\_\_

38. Out of the last five short trips you took with your child (trip time about 20 minutes or less), how many times did you use a child restraint device with your child?

0    1    2    3    4    5

39. Out of the last five long trips you took with your child (trip time one hour or more), how many times did you use a child restraint device with your child?

0    1    2    3    4    5

40. Out of the last five short trips you took with your child (trip time about 20 minutes or less), how many times did you use your seat belt?

0    1    2    3    4    5

41. Out of the last five long trips you took with your child (trip time one hour or more), how many times did you use your seat belt?

0    1    2    3    4    5

42. Were you the driver of the car when you received this questionnaire?

- 1. Yes
- 2. No

43. What is your age? \_\_\_\_\_

44. What is your sex?

- 1. Male
- 2. Female

45. Please list your occupation and employer and your spouse's occupation and employer. If not presently employed, check (✓) unemployed.

YOURSELF

YOUR SPOUSE

a. Occupation \_\_\_\_\_

a. Occupation \_\_\_\_\_

b. Employer: \_\_\_\_\_

b. Employer \_\_\_\_\_

c. Unemployed

c. Unemployed

46. What was your total family income last year before taxes?

- 1. Less than \$5,000
- 2. \$5,000 to \$9,999
- 3. \$10,000 to \$14,999
- 4. \$15,000 to \$19,999
- 5. \$20,000 to \$24,999
- 6. \$25,000 to \$29,000
- 7. \$30,000 or more

47. From youngest to oldest, please indicate the sex and birthdate of your children. Please also indicate whether or not they are currently living in your household. (If you have more than eight children, please list the eight youngest.)

	SEX		BIRTHDATE		LIVING AT HOME?	
	Female	Male	Month	Year	Yes	No
Child #1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>
Child #2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>
Child #3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>
Child #4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>
Child #5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>
Child #6	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>
Child #7	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>
Child #8	<input type="checkbox"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>

If you would like for us to send your child the free story booklet explaining child restraint devices and why children need them, please list the following information:

Child's name: \_\_\_\_\_

Mailing address: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Date: \_\_\_\_\_

Code:

[Empty box for code]

## Tier 4 In-Depth Interview Discussion Guide

### Topic Areas

#### I. Automobile Safety

How safe do you think you and your child(ren) would be in your car in a minor collision say 25 or 30 mph?

##### Probes

How safe do you feel in your car when you are not wearing safety belts? Why?

How safe do you feel in your car when you are wearing safety belts? Why?

When do you wear safety belts? Why?

How comfortable do you feel safety belts are in general? Why?

How easy to use do you think safety belts are? Why?

How do you feel about child restraint systems? Why?

Do you feel that children are safer when they ride in them? Why?

When do you use child restraint devices with your child(ren)? Why?

Do you think they are comfortable for children? Why?

Do you think they are relatively easy or hard for parents to use with their child(ren)? Why?

#### II. Government Regulation

Do you think that government regulations regarding certain safety practices help families live more safely? Why?

##### Probes

Should the government require parents to have their children immunized against certain diseases? Why?

Do children have rights independent of family or parental rights? Why?

Do you think that parents always know what is best for their children?

Do you think that society has a right to "outlaw" certain behavior? Why?

Should parents have the final say about what they do with their own children? Why?

Does society have some responsibility to protect people from themselves? Why?

Should the government set standards for toy safety? Why?

Is the government ever justified in taking children from parents? Why?

Under what conditions do you feel the government should regulate a family's behavior? Why?

What aspects of family life do you feel it is appropriate to regulate? Why?

Should the government protect children from child abuse and neglect? Why?

III. What are the ages of your children?

IV. Child Restraint System Experience

Do you currently use a child restraint system with any of your children? (yes or no)

A. What brand is it?

B. What type is it? (Show illustration of 4 basic types)

C. When did you start using it? Why?

D. What do you like best about it? Why?

E. What do you like least about it? Why?

V. Tennessee Child Passenger Protection Law

Have you heard of the Tennessee Child Passenger Protection Law?  
(yes or no)

How did you hear about it?

What do you know about it?

Probes

What do you think about the law? Why?

Do you think parents obey it? Why?

Do you think parents are more aware of automobile safety  
because of it? Why?

APPENDIX C  
LETTERS TO PARENTS

Letter Accompanying Tier 3 Questionnaire



TRANSPORTATION CENTER



The University of Tennessee  
Knoxville, Tennessee 37916  
Phone (615) 974-5255

October 15, 1978

Dear Parent:

The University of Tennessee Transportation Center and the State of Tennessee are working to make travel in Tennessee safer for our children through the Child Passenger Safety Program. Currently, automobile accidents claim the lives of more young children than any childhood disease. It is our objective to reduce the number of injuries and deaths of children involved in automobile accidents.

We are asking you to participate in one part of the Child Passenger Safety Program which is being conducted to further our knowledge about the safety of children in automobiles. Your participation will be strictly confidential. The enclosed questionnaire is identified by a code number, and only researchers involved in data collection will have access to individual responses. Only summary data will be used in any reports of the program. You are free to withdraw your participation if you should desire to do so.

In appreciation of your participation we will send your child a story booklet. In order to receive this booklet just fill out the mailing information at the end of the questionnaire and return the completed questionnaire in the envelope provided.

Please send us your completed questionnaire as soon as possible. The self-addressed envelope has been prepaid for you. If you have any questions, please contact us at the Transportation Center. Thank you for your assistance. We look forward to hearing from you.

Sincerely,

Kenneth W. Heathington, Ph.D., P.E.  
Director

KWH:mag  
9747

Enclosures

Letter Accompanying Follow-Up Tier 3 Questionnaire



TRANSPORTATION CENTER

The University of Tennessee  
Knoxville, Tennessee 37916  
Phone (615) 974-5255

January 31, 1978

Dear Parent:

As you may recall, someone from the Tennessee Child Passenger Safety Program spoke with a member of your family earlier this autumn. We asked about the use of child restraint devices in your car and your ownership of child restraint devices. At that time a member of your family was given a copy of the program's questionnaire. The questionnaire is designed to give us information on your feelings and needs concerning safety and child restraint devices. Through this safety program several groups are working to reduce the number of deaths and serious injuries sustained by young children in automobile accidents.

I urge you to fill out the questionnaire today. Enclosed is an additional copy of the questionnaire for your convenience. It does not cost you anything to mail it back to us in the postage-paid envelope. In fact, we will send your child a free story booklet if you complete the questionnaire.

Remember, your opinions and needs are extremely important to us. I look forward to receiving your response.

Sincerely,

Kenneth W. Heathington, Ph.D., P.E.  
Director

KWH:jlj

Enclosure

Letter Requesting Interview



TRANSPORTATION CENTER

The University of Tennessee  
Knoxville, Tennessee 37916  
Phone (615) 974-5255

Mr. and Mrs. John Smith  
100 Appian Way  
Knoxville, TN 37919

Dear Mr. and Mrs. Smith,

We want to thank you again for participating in the Tennessee Child Passenger Safety Program. Your cooperation is helping us learn more about how families in Tennessee feel about seat belts and children's car seats.

A small group of families are being asked to participate in a personal interview with one of our staff members. We feel very strongly that this personal contact will provide you with a more informal opportunity to share your ideas with us and will help us understand Tennessee families' needs and feelings more clearly.

The interview would take only about one hour of your time and will be very informal. I will be contacting you in the next few days to talk with you about a convenient time to meet and to answer any questions you may have.

We would greatly appreciate the opportunity to talk with you. Thank you for your attention to our request for your additional assistance.

Sincerely,

Christy Hughes

CH:gm/2437